ORIGINAL 0000096516

RECEIVED

BEFORE THE ARIZONA CORPORATION COMMISSION

2001 AUG 31 P 3:31

AZ CORP COMMISSION
DOCUMENT CONTROL

WILLIAM A. MUNDELL
CHAIRMAN
JIM IRVIN
COMMISSIONER
MARK SPITZER
COMMISSIONER

IN THE MATTER OF THE INVESTIGATION INTO QWEST CORPORATION'S COMPLIANCE WITH CERTAIN WHOLESALE PRICING REQUIREMENTS FOR UNBUNDLED NETWORK ELEMENTS AND RESALE DISCOUNTS	DOCKET NO. T-00000A-00-0194

QWEST CORPORATION'S POST-HEARING BRIEF

Timothy Berg
Theresa Dwyer
FENNEMORE CRAIG
3003 North Central, Suite 2600
Phoenix, Arizona 85012

John Devaney
Norton Cutler
PERKINS COIE LLP
607 Fourteenth Street, N.W.
Suite 800
Washington, D.C. 20005-2011

Attorneys for Qwest Corporation

Arizona Corporation Commission
DOCKETED
AUG 31 2001
DOCKETED BY

DATED: August 31, 2001

CONTENTS

I. Introduction

In compliance with the Telecommunications Act of 1996 (the "Act"), Qwest Corporation. ("Qwest") offers competitive local exchange carriers ("CLECs") a full range of interconnection services, unbundled network elements ("UNEs"), and resale products. These offerings provide CLECs with a meaningful opportunity to compete in Arizona's local exchange market. The purpose of this proceeding is to establish prices for Qwest's interconnection services and UNEs that will compensate Qwest while promoting the Act's multiple goals of competition in local exchange markets, encouraging investment in telecommunications networks, and fostering advancements in telecommunications technologies.[1]

In this phase of the Commission's docket, Qwest has presented cost studies and proposed prices for a substantial majority of the interconnection services and UNEs that the Act requires. Although the record relating to the large number of issues that this docket presents is voluminous and often complex, the Commission can resolve each issue fairly and lawfully by adhering to the Act's mandate of establishing prices that are based on Qwest's costs. To achieve the goal of cost-based pricing that complies with the FCC's definition of total element long-run incremental costs ("TELRIC"), the Commission should be guided by two basic principles.

First, the proper application of TELRIC requires that the Commission's determinations of Qwest's costs be grounded in reality. TELRIC requires the use of forward-looking technologies and assumptions, but the assumptions upon which the Commission bases its pricing decisions should be informed by experience. If an assumption labeled by a party as forward-looking is demonstrated by experience to be unrealistic, the Commission should reject it. Qwest has presented testimony from engineering witnesses who have hands-on experience installing

---

[1] The parties have agreed upon the wholesale discounts that will apply to resale services and, therefore, did not address issues relating to resale in the hearing.

network facilities in Arizona and other states in Qwest's region. These witnesses provide an important link between hypothetical cost studies and the realities of what is actually required to build a network. Similarly, Qwest has more than five years of experience in providing CLECs with interconnection services and UNEs, and Qwest's witnesses have real-world, experience-based knowledge of the types of activities that must be performed to provide these services and elements. The forward-looking cost assumptions that the Commission adopts should be measured against this body of experience.

Second, establishing prices that are truly cost-based requires divorcing policy objectives from pricing decisions and having an almost single-minded focus on the relatively straightforward issue of determining costs that go into a service or a product. Determining rates based on policy will not lead to cost-based prices, but cost-based prices will ultimately lead to the Act's policy objectives. For example, some of the CLECs attempt to persuade the Commission to set prices with an eye toward ensuring that they earn a profit, arguing that prices set in this manner will promote competition. However, this approach to pricing clashes with the Act's long-term goal of promoting competition not just through the CLECs' use of resale services and UNEs, but also in the form of the CLECs investing in their own facilities and building their own networks. Cost-based prices will lead to rational economic decisions by CLECs concerning how to compete and whether to build their own facilities, while prices that are designed to ensure that CLECs earn a profit will have the opposite effect. Accordingly, the Commission should resist the CLECs' attempts to inject policy considerations into the process of establishing cost-based prices.

In the remainder of this brief, Qwest discusses: (1) the legal framework for the Commission's pricing decisions; (2) the appropriate methodology for establishing recurring prices and Qwest's recurring cost studies; (3) the parties' competing cost studies relating to the unbundled loop; (4) the appropriate methodology for establishing nonrecurring rates and the parties' competing nonrecurring cost studies; (5) costs and rates relating to collocation; (6) costs, rates, and other issues relating to line sharing and line splitting; (7) Qwest's recovery of the costs associated with modifying operation support systems to permit their use by CLECs; (8) prices for operator services and directory assistance; and (9) reciprocal compensation for Internet traffic.

II. The Legal Framework for Costing and Pricing Decisions

The legal framework for the costing and pricing issues that this docket presents begins with the Act, the FCC's pricing rules, and interpretation of the Act and the rules by federal courts. The Commission's ultimate obligation, as established by section 252(d)(1) of the Act, is to establish rates that are "just and reasonable" and that are based on the cost of an unbundled network element or an interconnection service. As discussed below, the requirement of cost-based pricing does not permit establishing rates that are intended to "jump-start" competition at the expense of an ILEC's right to recover its costs. Nor does the requirement of cost-based pricing allow establishing rates for UNEs based upon rates that other state commissions have established in other cost proceedings.

A. The Pricing Requirements of the Telecommunications Act of 1996, the FCC, and Related Decisions of Federal Courts

1. The Requirement of "Just and Reasonable" Rates

Section 252(d)(1) of the Act requires state commissions to establish rates for interconnection and unbundled network elements that are "just and reasonable." This right of cost recovery reflects the careful balance that Congress struck in passing the Act. While taking the extraordinary step of requiring ILECs like Qwest to turn over pieces of their networks to competitors, Congress sought to ensure that the ILECs would be properly compensated for this mandated use of their property.

To that end, section 252(d)(1)(A)(i) of the Act specifically mandates just and reasonable rates for interconnection and access to unbundled elements that are to be "based on the cost (determined without reference to rate-of-return or other rate-based proceeding) of providing the interconnection or network element." In its pricing rules that implement the Act, the FCC has established that prices should be based on TELRIC. In addressing TELRIC, the Eighth Circuit has stated that state commissions should apply this pricing methodology with an eye toward reality and not for the purpose of developing "imaginary" costs.[2]

2. The CLECs' Request for UNE Pricing that Establishes a "Competitive Springboard" Violates the Requirement of Cost-based Pricing.

Joseph Gillan, a witness for AT&T and WorldCom, suggests that the *only* way to realize true competition in the local market is to provide CLECs with access to the UNE platform ("UNE-P") with prices that are designed to "provide a springboard to a competitive future." Ex. AT&T/WorldCom-1 (Gillan Dir.) at 2, 9. He then concludes that Qwest's proposed UNE rates are so high as to prohibit competition in the residential market. *Id.* at 14. Mr. Gillan's analysis is faulty in at least three respects.

First, by holding UNE-P out as the *only* means of achieving competition, Mr. Gillan ignores the fact that real local exchange competition is currently taking place in Arizona based on actual investments in fiber, switching, wireless networks, and cable facilities. This reality contradicts Mr. Gillan's assertion that UNE-P is the only means by which competition can be achieved. Ex. Qwest-29 (Fitzsimmons Reb.) at 84 (Fitzsimmons Reb.).[3]

Second, contrary to Mr. Gillan's assertion, the Commission's directive in setting rates is *not* to "provide a springboard to a competitive future." Rather, it is to set prices for UNEs that reflect true economic cost. At the hearing, Staff's witness, William Dunkel, was asked to explain

---

[2] *Southwestern Bell Telephone Company v. Missouri Public Service Commission*, 236 F.3d 922, 925 (8th Cir. 2001); *Iowa Utils. Bd. v. FCC*, 219 F.3d 744, 751 (8th Cir. 2000) ("*Iowa Utils. II*").

[3] In his Direct Testimony, Gillan suggests that UNE-P is the sole reason competition has increased in New York and a few other states. *See* Ex. AT&T/WorldCom 1 (Gillan Dir.) at 10-12. Mr. Gillan's analysis, however, fails to account for the impact of ILEC entry into the long distance market. In New York, AT&T and MCI WorldCom's rapid movement into the residential services market suggests that these companies were anticipating Verizon's entry the long distance market and were positioning themselves to compete with Verizon. Ex. Qwest-29 (Fitzsimmons Reb.) at 84.

"the anticipated effects on competition" of certain proposed rates. Mr. Dunkel responded as follows:

> I don't really have an answer because that's not what I considered in preparing my testimony in this case. . . . [T]he Telecommunication Act of 1996 for UNE rates requires they be based on costs. It gives a few requirements, but *there was no requirement it be based on the impact on competitors or anything along those lines*. So what I'm doing in this case is trying to look at the costs, and I understand there's conflicting costs, conflicting data. But to the best of my ability, identify what the costs actually are and set rates based on that. *If that helps or hurts a particular competitor is not something that we input into the proposed rates.*

Transcript ("Tr.") at 1204 (emphasis added). The substance of Mr. Dunkel's testimony is echoed by a recent FCC order granting SBC's Section 271 application in Oklahoma. In that case, the FCC refused to consider the profitability of CLEC entry into the residential market in evaluating Oklahoma's UNE prices, reasoning as follows:

> Parties also assert that the Oklahoma promotional UNE rates are so high that no competitive LEC could afford to use the UNE platform to offer local residential service on a statewide basis. *Such an argument is irrelevant. The Act requires that we review whether the rates are cost-based, not whether a competitor can make a profit by entering the market.*[4]

Likewise, Mr. Gillan's testimony regarding the effect of Qwest's proposed rates on a competitor's profit is irrelevant to this Commission's determination of UNE prices.

Third, Qwest's proposed rates do not prohibit competition in the residential market. Mr. Gillan's analysis in this regard underestimates important sources of revenue. In concluding that Qwest would run "squarely in the red" if it were to pay itself the proposed UNE-P lease rates, Mr. Gillan has erroneously omitted important sources of revenue derived from providing a

---

[4] Memorandum Opinion and Order, *In the Matter of Joint Application by SBC Communications Inc., Southwestern Bell Telephone Company, and Southwestern Bell Communications Services, Inc. d/b/a Southwestern Bell Long Distance for Provision of In-Region, InterLATA Services in Kansas and Oklahoma*, CC Docket No. 00-217, FCC 01-29 (rel. Jan. 22, 2001) ¶ 92 ("*SBC Kansas/Oklahoma 271 Order*") (emphasis added).

complete range of services to the residential customer, most notably revenue associated with vertical features and special access services. *See* Ex. Qwest-8 (Fleming Reb.) at 6. When Mr. Gillan's errors are corrected, the analysis reveals that Qwest could turn a significant profit by leasing the UNE-P from itself.

3. The FCC's "Compliance Test"

Dr. George Ford, a witness for Z-Tel Communications, Inc., suggests that the Commission should apply the FCC's so-called TELRIC compliance test in setting UNE rates. Ex. Z-Tel-1 (Ford Dir.) at 14. However, it would be improper to abandon the requirement of cost-based pricing and to determine UNE rates based upon solely upon the FCC's compliance test.

The FCC developed the TELRIC compliance test in its order granting section 271 approval to Southwestern Bell Telephone Company for the state of Oklahoma.[5] The test compares the prices in one state to those in another state, using the results of the FCC's Synthesis Model as a relative gauge of the differences in costs between the states. In the Oklahoma order, the FCC found that the Oklahoma Commission had violated TELRIC principles in setting a loop rate. Upon identifying this violation, the FCC adopted and applied its newly formulated compliance test to determine if the state commission's error resulted in prices that were outside a reasonable range. *See* Ex. Qwest-8 (Fleming Reb.) at 17. The purpose of the test was to assess the reasonableness of UNE prices established by a state commission that had erred in its application of TELRIC principles. *Id.* at 18. Thus, the test is intended for limited use.

In this case, Dr. Ford selectively applies the test to achieve his desired result. Although there are five states that have been granted 271 relief, Dr. Ford selects only three as the basis of his comparison, omitting New York and Massachusetts from his analysis. The three states

---

[5] *SBC Kansas/Oklahoma 271 Order* at ¶ 84.

selected, Kansas, Oklahoma and Texas, happen to have the lowest relative loop prices. In fact, Dr. Ford acknowledged at the hearing that if all five states had been included in his loop rate analysis, the resulting upper bound for the "range of reasonableness" would be approximately $16.50, a rate that is well in excess of the loop cost produced by the .Joint Intervenors' HAI model. Tr. at 1809 (Ford Cross). Further, Mr. Fleming demonstrated that application of the test to rates in states that meet one or more of the comparison criteria established by the FCC produces an upper bound of $18.21 for a range of reasonableness. Ex. Qwest-8 (Fleming Reb.) at 27-28.

Accordingly, the Act and the FCC's rules do not permit using the compliance test as a substitute for cost-based pricing. When the compliance test is applied properly, it establishes an upper bound for a range of reasonableness that substantially exceeds Mr. Ford's estimate.

B. The Commission's First Wholesale Cost Docket and Related Judicial Review

On August 30, 1996, the Commission determined that permanent rates for interconnection and UNEs and wholesale discounts would be established in a generic wholesale cost docket. That docket went to hearing on November 18, 1996. The Arbitrators issued a proposed order on June 13, 1997, and the Commission issued a final order setting permanent prices and discounts on January 30, 1998.[6]

The Cost Order also determined Qwest's permanent prices for unbundled loop and network elements and a permanent discount rate for resale services. The Commission further ordered its Hearing Division to set a proceeding to determine whether it was appropriate to geographically deaverage the rates established in its Cost Order, and if so, to establish the method for deaveraging the rates and the effective date for the deaveraged rates.

---

[6] *See* Arizona Corporation Commission Decision No. 60635 ("Cost Order").

Despite the stay of the FCC's TELRIC rules that the Eighth Circuit issued in 1996, the Commission decided to apply TELRIC pricing for interconnection of UNEs. In doing so, the Commission relied, in part, on its own regulations requiring compliance with total service long run incremental cost ("TSLRIC"), which bases costs on "the least cost, most efficient technology that is capable of being implemented at the time the decision to provide service is made."[7] The Commission concluded that the parties' TELRIC pricing models were consistent with TSLRIC and applied those models.

Subsequent to the entry of the first Cost Order, several CLECs filed suit in United States District Court for the District of Arizona challenging the Commission's pricing terms and alleging that portions of the Cost Order failed to meet the requirements of the 1996 Act.[8] The court upheld the Commission's unbundled network element rates as conforming to the FCC's guidelines and the 1996 Act, finding that the Commission properly interpreted the Act and its implementing regulations while protecting the public interest.[9]

The court further upheld the balance of the Cost Order with the exception of three issues, which the court remanded to the Commission for reconsideration: (1) the four-loop wire price; (2) the non-recurring charges; and (3) the customer transfer charge.[10] Several issues relating to the wholesale prices and other terms and conditions were appealed to the United States Court of Appeals for the Ninth Circuit, which has not yet ruled. The remanded issues that were not appealed are included in this Phase.

---

[7] *See* A.A.C. R14-2-1309.

[8] Qwest also raised challenges to portions of the Commissions' decision in Cause No. CIV 97-0026.

[9] *See U.S. West v. Jennings*, 46 F.Supp.2d 1004, 1009-1010 (D.Ariz. 1999).

[10] *Id.* at 1027-1028.

III. Recurring Costs and Prices for Unbundled Network Elements

Recurring costs are the ongoing costs associated with providing a service or a network element. These costs generally are investment-related and include capital costs and operating expenses. Recurring costs typically are presented as a cost per month or a per unit of usage and are incurred throughout the period that Qwest provides a service or a network element to a customer. Qwest's methodology for estimating recurring costs is described below. This discussion includes responses to several unfounded criticisms of Qwest's recurring cost methodology that the CLECs have raised.

A. TELRIC and Qwest's Cost Modeling Framework

TELRIC is the primary cost principle for deriving pricing of interconnection and UNEs under the Act. TELRIC plus an allocation of common costs make up the "long-run" component for setting prices -- that is, they reflect the costs that an unregulated firm would incur. The TELRIC methodology is forward-looking in nature, meaning that it estimates the cost of building and operating an efficient network, given current build-out conditions and the best currently available technology. Ex. Qwest-16 (Million Dir.) at 3-5.

Qwest's cost studies are specifically designed to comply with TELRIC. The studies identify the *forward-looking* direct costs caused by the provision of an interconnection service or network element in the *long run*, plus the incremental cost of shared facilities and operations. Qwest's studies also identify *total element* costs – the average incremental cost of providing the entire quantity of the element. The assumptions, methods, and procedures used in Qwest's studies are designed to yield the forward-looking *replacement* costs of reproducing the telecommunications network, considering the most efficient, least-cost technologies that are currently available. *Id.* at 3.

An important component of Qwest's studies and TELRIC studies in general is the assumption that the telephone network is being "built from scratch," assuming the existing location of network "nodes" or switches. Thus, Qwest's studies identify the total "replacement" costs associated with serving all of Qwest's current demand, not the costs of adding equipment to an existing network to meet a small increment in demand. As a result, the studies include the efficiencies and economies of scale that arise from a single carrier building a total replacement network to serve total demand. *Id.* at 4.

The increment that is studied in Qwest' cost analyses is the total quantity of the network element. Therefore, the studies calculate the average forward-looking cost for all units of output, rather than the marginal cost of the next or last unit of output. *Id.* The "forward-looking costs" that are included in Qwest's studies are those that are likely to be incurred in the future using the least-cost, forward-looking technologies and methods of operation that are currently available and practical to deploy in the network, given demand for the total element. Thus, in calculating appropriate TELRIC costs, it is important to consider, as Qwest has, what is currently being deployed in the network as well as what reasonably can be expected to be used on a forward-looking basis. *Id.* at 5.

For example, Qwest's Loop Module or LoopMod considers the least-cost, forward-looking mix of copper, fiber and integrated pair gain equipment. Thus, the model considers not just "state-of-the-art" technology (e.g., fiber), but also the "least-cost" way of providing the element in a given network application. For unbundled loops, copper facilities represent the least-cost technology for shorter loops and where demand is relatively low, while fiber and electronics represent the least-cost technology for longer loops and where demand is relatively high. *Id.* at 7.

Consistent with TELRIC, the forward-looking technologies that Qwest uses in its studies are those that are commercially available and are currently being deployed in the industry. The studies do not rely on technologies that might be available in the future. There is too much uncertainty about unproven, potential technologies to permit their use in cost studies, including uncertainty about whether the technologies will actually become available, the potential cost of the technologies, and the potential uses of the technologies. Nor do the studies rely exclusively on "state-of-the-art" technologies that may be available but are impractical to deploy in every situation. *Id.* at 5-6.

For example, fiber-based DS1 technologies are considered to be "state-of-the-art." However, in circumstances where utilization is low (e.g., there is demand for only 1 or 2 DS1s at an end-user location) and is not likely to increase in the foreseeable future, it is impractical to deploy fiber rather than copper-based DS1s. This is because a fiber-based DS1 technology, such as OC3, provides capacity for 84 DS1s at only one location unless appropriate electronics are deployed in multiple end-user locations. The cost of these electronics causes fiber to be far more costly, and thus impractical to deploy than copper on a per-DS1 basis in low demand situations. *Id.* at 6.

Qwest also uses current market prices to determine the costs for the equipment and materials that it includes in its studies. Placement costs are based on the expenditures that the network organization currently incurs to perform the relevant functions, based on actual contracts with vendors that do work for Qwest in Arizona. Expense factors are based on currently incurred costs adjusted for known or anticipated changes. Each assumption is designed to reflect the forward-looking cost of placing the network. *Id.* at 7.

In addition, Qwest's studies include forward-looking operating expenses. Qwest adjusts its recent expense information to develop annual cost factors that estimate forward-looking costs. Using historical information as a starting point, Qwest adjusts its expense factors to account for future efficiencies and expected inflationary/deflationary price impacts.[11] *Id.* at 8.

Finally, for all of its cost models, Qwest takes steps to validate the assumptions and inputs that it uses. Qwest utilizes a variety of approaches to ensure the reasonableness of its

---

[11] This is accomplished via the "estimated cost savings" and "inflation" inputs in the Expense Factor Module.

TELRIC estimates and assumptions. For example, component prices are taken directly from vendor quotes with Arizona specific loadings (e.g., sales tax) applied. Placement costs contained in Qwest's loop costing model are taken directly from actual network contracts with Arizona vendors. Assumptions are verified through discussions with internal experts about actual construction experiences and vendor bid responses, along with other relevant data. Since TELRIC, by its very nature, represents a rebuild of the total network, it is critical that all relevant available information be used to confirm model assumptions, inputs and logic. Qwest's cost analysts also spend extensive time reviewing cost data for related UNEs and for the same UNEs in other states to ensure that the models' results are within a range of reasonableness. *Id.* at 28.

B. Qwest's Integrated Cost Model

Qwest's Integrated Cost Model ("ICM") is designed to estimate the *recurring* TELRIC for UNEs and interconnection services. The ICM produces recurring costs for the major UNEs and interconnection services, including the unbundled loop, switching, transport and other element. The model has five modules: switching, loop, transport, capital costs, and expense factors. *Id.* at 9.

The ICM runs each of the modules and inserts the results from each module into the Output Workbook. The Output Workbook uses the results of each module, along with special study inputs, to calculate the TELRIC for each UNE and interconnection service. First, investment-related factors are applied to investments to provide the investment-related monthly costs (e.g., depreciation, cost of money, income tax and maintenance) for each UNE and interconnection service. Second, the expense-related factors are applied to the investment-related costs to yield the monthly cost for operating expenses, such as product management and network operations and support. Third, the Output Workbook sums all of the monthly costs to provide the monthly TELRIC for the UNE. Finally, the Output Workbook provides an allocation of common costs (e.g., executive, planning, other general and administrative expenses) to each UNE and interconnection service. *Id.* at 9-10.

The ICM and its modules contain recommended default inputs. However, the ICM provides input forms for each of the modules, which allow the user to change key input assumptions. The input forms display the default value for each input item and allow the user to override these values if desired. For example, LoopMod provides input forms that allow the user to view the default values that are used to reflect how often different placement methods are used to place buried cable and, if desired, to change those values to reflect different assumptions about placement methods. After all desired changes are made to the inputs, the user can easily rerun the ICM to produce UNE cost results based on the new user assumptions. *Id.* at 10.[12]

Brief descriptions of the modules that are included in the ICM are set forth below.[13]

1. The Loop Module

LoopMod is a program that develops investment for a subscriber loop and drop wire. It calculates the investment for loops and drop wires based on standard engineering loop designs, vendor prices, and placement costs that are based upon Arizona-specific experience with vendors. The investments in LoopMod include the costs associated with the materials, construction, and engineering that are required to build loop plant from the central office to a subscriber. The amounts of investment that LoopMod includes are based primarily on data specific to Arizona. Examples of Arizona-specific data that are used in LoopMod include the quantity of lines in service, the prices charged by contractors for activities associated with placing outside plant, and the nature of the distribution areas for which the module develops

[12] The ICM is simple and user friendly. The model can be run on most windows-based personal computers. It contains a "point and click" interface that is easily navigated by the user. The user can view results, study assumptions, study inputs, etc., and make changes when desired. A user can run a new TELRIC study, based on the user's specifications, in a relatively short period of time. Any interested party can run the model by following the user guide instructions. Ex. Qwest-16 (Million Dir.) at 11.

[13] Because issues relating to switching have been deferred until the next phase of this docket, this discussion of ICM does not include a description of the Switching Module.

investment. After LoopMod calculates the investment, the results are converted to monthly costs. Ex. Qwest-1 (Buckley Dir.) at 2.

A more detailed discussion of LoopMod is set forth below in the section of this brief that addresses the recurring costs and prices for the unbundled loop.

2. The Transport Module

The Transport Module is used to estimate the investment in transmission and channel termination equipment needed to provide transport between two switching offices. This module calculates the costs of dedicated and switched transport.

The transmission investment is mileage sensitive, and it includes the cost of fiber facilities and intermediate multiplexing equipment. The channel termination investment is fixed in nature, and it includes the electronic equipment at the switch location (where the route originates and terminates) that converts electronic signals into optical signals, as well as the equipment used to multiplex or de-multiplex a signal. Ex. Qwest-16 (Million Dir.) at 18-19.

For every point pair (i.e., any combination of connections between two wire centers) in Arizona, the transport model calculates investment per circuit for channel termination equipment, fiber optic facilities, and intermediate multiplexing equipment. The investments associated with each point pair are sorted into mileage bands. For each mileage band, the model calculates fixed (termination) and distance sensitive (transmission) investments. These investments are converted into costs in the ICM Output Workbook. *Id.* at 20.

The key inputs in the Transport Module are the utilization rates or fill factors, and the vendor costs for various types of equipment (e.g., the cost per foot for fiber or the cost of a fiber distribution panel). The utilization factors for D4 channel banks, M 1/3 multiplexers, and fiber terminals are developed from data in the TIRKS (Trunk Integrated Record Keeping System) database. TIRKS is a system that Qwest uses for order control and integrated record keeping which allows for highly mechanized provisioning of complex design services. The TIRKS database is a repository for the inventory, capacity and utilization information related to services such as SONET-based interoffice facilities. The utilization factors are calculated based on the demand for, and capacity of, the equipment tracked in TIRKS. *Id.* at 20-21.

The default material investments used in the Transport Module for the equipment and facilities described above are found in vendor contracts or price lists. The material investments for the standard transport configurations are determined by engineers whose job it is to develop the transport configurations currently in use at Qwest. Thus, the material prices used as defaults in the ICM reflect the current prices that Qwest must pay vendors to purchase equipment used to provide transport. *Id.* As such, these prices are consistent with the TELRIC requirement of forward-looking costs based upon technology that is currently available.

3. Capital Cost Module

The key inputs to the Capital Cost Module are the cost of money and depreciation lives. The ICM allows the user to select the Qwest economic or state-prescribed cost of capital, or to enter a specific cost of equity, cost of debt and debt to capital ratio. The ICM also allows the user to select the Qwest economic, state-prescribed or FCC-prescribed depreciation lives and network salvage values, or to change the depreciation lives and net salvage for every plant account. The user can also choose either equal life group or straight-line depreciation.

In this case, for each of its studies, Qwest is using a rate of 9.61 percent for the cost of money. Ex. Qwest-18 (Million Reb.) at 18-19. The Commission approved this rate as part of the settlement in Docket No. T-01051B-99-0105, et al. Qwest also is using the depreciation lives that the Commission has prescribed. *Id.* at 35-36.

4. Expense Factors Module

To calculate expense factors, the Expense Factors Module relies on expenses and investments pulled directly from standard accounting reports. These reports are from Qwest's actual books. The cost factors are based upon historical relationships, and all costs on Qwest's books are accounted for.[14] The module removes from the calculation of the factors the costs that are directly assigned to elements and costs that are not relevant to a TELRIC study. The module identifies the costs that have been removed to enable the user to audit fully the process for developing the factors. All of the calculations that go into the development of the factors are contained in one set of worksheets. Ex. Qwest-16 (Million Dir.) at 23.

The key inputs to the Factors Module are the efficiency and inflation/deflation factors. In the Factors Module input screen, the user may input a "cost savings value" and an "inflation rate." The cost savings value estimates the gains expected in productivity or efficiency, while the inflation rate estimates the amount of inflation (or deflation) anticipated. These values can be applied on an account-specific basis or applied uniformly to all accounts. *Id.* at 24-25.

The cost savings value input that Qwest uses in its studies is based on the X-Factor productivity estimates that were put forth in FCC Docket No. 97-159.[15] The calculation of Qwest's cost savings value is a weighted average of the X-Factor productivity estimates reported by the FCC, AT&T and the United States Telephone Association ("USTA") in that docket; this weighted average produces a two-year efficiency gain of 10.25 percent. The base expenses are at a 1999 level, so this input reflects estimated efficiency gains resulting from increased labor productivity and improved technologies for the two-year period from 1999 to 2001. Qwest selected this percentage as an aggressive estimate of future efficiencies, relative to Qwest's historical trends. *Id.* at 25.

The Expense Factors Module includes an inflation input of 8.78 percent. This value is based on a Wage & Salary Index analysis that the economic consulting firm, Joel Popkin and Company, prepared. The analysis relies on data and other information specific to Qwest to

---

[14] As noted below, factors are adjusted to account for inflation/deflation and efficiency gains.

[15] **[Provide full cite]**

produce a company-specific estimate of inflation for 1999 through 2001. The company-specific information upon which this figure is based includes Qwest's union labor contract and compensation and benefits practices. This input compares to a Consumer Price Index ("CPI") of 6.04 percent, which includes more than wages and salaries and is based on national averages. Qwest's inflation rate is more appropriate than the CPI because it specifically reflects the business environment in which Qwest operates. *Id.*

C. Qwest's UNE-Specific Recurring Cost Studies

Using ICM, Qwest has presented recurring cost studies in this docket for the unbundled loop, multiple types of transport, database services, and signaling. Ex. Qwest-16 (Million Direct) at 36-37. In addition, Qwest has presented stand-alone recurring cost studies for the following elements: DS1 and DS3 capable loops, distribution subloops, building cable, dark fiber, local inerconnection service expanded interconnection channel termination ("LIS-EICT"), poles and conduits, daily usage record files, CLEC to CLEC connections, low side channelization, unubundled calling name service, category 11 records, and CLASS Call Trace. These studies are described in Ms. Million's testimony. *Id.* at 45-60.

With the exception of the study relating to poles and ducts, Qwest follows the same forward-looking TELRIC methodology in the stand-alone studies that is described above in connection with the ICM. *Id.* Consistent with an FCC directive, the study relating to poles and conduit is based on historical costs. *Id.* at 57-58.

D. The Joint Intervenors' Criticisms of Qwest's Recurring Cost Studies are Inaccurate.

The Joint Intervenors' primary challenges to Qwest's recurring cost studies focus on inputs that Qwest uses relating total installed factors ("TIFs"), fill factors, and expense factors. None of these challenges has merit.

1. Qwest's Recurring Cost Studies Use Appropriate and Reasonable Total Installed Factors and Fill Factors.

Qwest's TIFs are reasonable, forward-looking, and well-supported by the company's actual experience in Arizona. TIF also is appropriately referred to as the "total investment factor," as the purpose of TIF is to estimate the total investment for an installed piece of equipment. As explained by Ms. Million, TIF is a cost factor that combines all proper investment loadings into one factor that, when multiplied against the material investments, provides a total installed investment. *See* Ex. Qwest-18 (Million Reb.) at 19. In contrast to the EF&I price for equipment, which includes the installation and engineering, application of the TIF factor to a material price calculates not only installation and engineering costs, but also other costs, including power, warehousing, transportation and finance charges. *Id.* Thus, properly calculated, TIF figures are higher than the investment loadings added to EF&I investment. *Id.*

While installation and engineering costs are the major components of TIF, the TIF factor also includes costs associated with a number of other factors, including investments for: (1) testing and power equipment required to properly operate the equipment represented by the material investment; (2) sales tax and interest during construction, added to the material investment to cover expenses Qwest incurs when it purchases equipment; and (3) warehousing and transporting the equipment from Qwest's warehouses to the equipment's ultimate location. *Id.* at 19-20.

Qwest relies on current General Ledger Journal files, as reflected in the company books, as well as other company reports (such as the MR2A) to calculate each of the underlying factors that make up the TIF. *Id.* at 20. In this regard, Qwest has consistently presented its material investment cost data on a fully loaded basis, using a TIF to arrive at that amount. *Id.* Although in the past the TIF may have been embedded in the costing data and, thus, not readily apparent in the study or model, Qwest's previously filed cost studies and cost models have included the TIF in a variety of ways depending on the level of material investment with which cost analyst started. *Id.* at 20-21.

Qwest's practice of developing a factor that reflects *actual* average costs to be added to material investments is more accurate than relying on engineering estimates and is appropriate in forward-looking cost studies. *Id.* at 21. Because the equipment for which TIFs are developed come in many configurations and forms and because "no two jobs are alike," often there are "peaks and valleys" in engineering estimates, making estimating very difficult, and not as accurate as using actual expenditures collected for the equipment being installed to develop an average loading factor." *Id.* Because the TIF represents a relationship of material investment to related expenditures based on data from the most current time period, it provides a forward-looking cost estimate based on Qwest's actual experience installing equipment. *Id.*

As demonstrated by Ms. Million and the testimony of Joint Intervenor witness, Thomas Weiss, during cross-examination, Mr. Weiss' criticisms of Qwest's TIFs are unfounded. First, Mr. Weiss's criticisms of Qwest's warehousing expense are at odds with his insistence that Qwest should be able to enjoy economies of scale when it comes to purchasing equipment. Whereas on the one hand he agrees that economies of scale should be built into the assumptions of a cost model, on the other hand, he does not allow for the warehousing or transportation of any of the large amounts of equipment that the telephone company would purchase to build the replacement network. He avoids warehousing expenses by assuming that the replacement network "should be built instantaneously." *See* Tr. at 1599 (Weiss Cross). Qwest's witnesses Mr. Fleming and Ms. Million underscored the unrealistic nature of this assumption. Put simply, to assume that the entire network could be rebuilt without ever having to warehouse or transport any of the facilities used in the rebuild is the type of unrealistic assumption that Mr. Weiss and the Joint Intervenors rely upon to artificially reduce costs. *See* Ex. Qwest-18 (Million Reb.) at 23.

Mr. Weiss' position on warehousing is but one example of a series of assumptions that he and the Joint Intervenors offer that do not comport with real-world conditions. Similarly, he takes an unreasonable position relating to whether TIFs should include an allowance for funds used during construction ("AFUDC") (*see id.* at 25-26) and Qwest's vendor and telco labor components (*see id.* at 26-28). In short, contrary to this "fantasy" approach, Qwest's studies accurately reflect the activities that would be necessary to accomplish a forward-looking replacement of the network in the real world.

Moreover, the factors suggested and criticisms offered by Mr. Weiss are unsupported. In an attempt to support his recommendations, Mr. Weiss relies on his "experience" with other carriers. *See, e.g.*, Tr. 1524-25, 1577-79 (Weiss Cross). Despite his heavy reliance on that experience, Mr. Weiss did not provide evidence of the TIFs of other carriers, and the Joint Intervenors did not provide any information about their TIFs. *See* Ex. Qwest-18 (Million Reb.) at 26-27.

Mr. Weiss' recommendations relating to fill factors or utilization rates are equally unrealistic and unsupported. To support his recommendations, Mr. Weiss focuses on only one of seven fill factors that Qwest uses for DS1 and DS3 capable loops and, not surprisingly, he chooses the lowest of the factors. As Ms. Million points out, Mr. Weiss' choice to build his analysis based upon only one factor is flawed. *See* Ex. Qwest-18 (Million Reb.) at 28-29. Mr. Weiss' recommendation of an 85 percent fill factor for DS1 and DS3 capable loops demonstrates the inappropriateness of his approach – such a factor simply does not comport with the real-world experience of Qwest in Arizona. *Id.* at 30-34. As with his claims regarding TIFs, Mr. Weiss's claim that an 85 percent fill is what would be achieved in a competitive market is unsupported by any real-world evidence. There is no record evidence indicating that Mr. Weiss's own clients, the Joint Intervenors, have utilization levels anywhere in line with those he suggests. Indeed, Mr. Weiss could not provide a single example of a competitive market in which an 85 percent fill was experienced. Tr. at 1575-76 (Weiss Cross). As the FCC has stated, "the per-unit costs associated with the element must be derived by dividing the total cost associated with the element by a reasonable projection of the actual total usage of the element."[16] While Qwest's fill assumptions are grounded in actual conditions and, thus, comport with these principles, Mr. Weiss' speculation does not.

The flawed nature of Mr. Weiss' assumptions and recommendations relating to fill factors and TIFs is especially significant given that TIFs make approximately a 20-25 percent difference in Qwest's recurring prices, while fill factors account for approximately 75-80 percent difference. Qwest's TIFs and fill factors are reasonable and appropriate for Arizona. They are based upon Qwest's real-world experience in serving the market in this state and are fully compliant with the Eighth Circuit's pronouncements regarding the use of realistic forward-looking assumptions in developing cost estimates.

2. Qwest's Recurring Cost Studies Use Reasonable Values for Expense Factors.

Avoiding concrete and empirical data-based critiques of Qwest's expense factors, Mr. Weiss and the CLECs choose instead to attack these factors based on nothing more than broad-based characterizations and appeals to "industry experience." As demonstrated by Ms. Gude's rebuttal testimony and Mr. Weiss's concessions on cross examination, however, the CLECs' extreme positions on expense factors simply are not tenable. First, Mr. Weiss, in supporting HAI, claims that costs associated with marketing, product management, and sales are "purely retail in nature and should not be included in wholesale cost studies." *See* Tr. at 1586 (Weiss Cross). This position does not withstand scrutiny. As Ms. Gude points out, while Qwest has for years supported wholesale access service offerings, with the passage of the 1996 Act Qwest has had to devote substantial resources to support an expanding set of wholesale offerings demanded by increasing numbers of CLECs. *See* Ex. Qwest-27 (Gude Reb.) at 6. Even Mr. Weiss

---

[16] First Report and Order, *In the Matter of the Implementation of the Local Competition Provisions of the Telecommunications Act of 1996,* CC Docket Nos. 96-98 & 95-185, FCC 96-325 (rel. Ag. 6, 1996) ("*First Report and Order*") at ¶ 682.

concedes that Qwest' CLEC-support activities are appropriate activities, the costs for which Qwest ought to be entitled to recover. *See* Tr. at 1587-89 (Weiss Cross). Mr. Weiss's bald claim that these activities should be provided free of charge because they should be a part of Qwest's "normal, routine commercial operations" (*see id.* at 1588) is wholly unsupported by any concrete analysis or evidence and, thus, should be rejected.

Second, Mr. Weiss's refusal to allow for *any* recovery at all for network operations finds not support in the record here and is contrary to Qwest's experience in maintaining the Arizona network. *See* Ex. Qwest-27 (Gude Reb.) at 9-10. Indeed, Mr. Weiss proposal to set this factor at zero cannot be squared with his own testimony. Contrary to HAI's zero-recovery approach which he supports, on cross examination Mr. Weiss conceded that Qwest should be able to recover expenses associated with at least some elements (such as shared transport and shared switching) which are "traffic sensitive, thereby necessitating the need to do traffic administration." Tr. at 1591 (Weiss Cross).

Third, Mr. Weiss's assertion that research and development costs are also "purely retail costs" is likewise without factual or legal merit. As Ms. Gude notes, Qwest's decision to create and apply overhead factors for these costs fully comports with the Act and TELRIC principles. *See* Ex. Qwest-26 (Gude Dir.) at 7-9; Ex. Qwest-27 (Gude Reb.) at 10-11. Moreover, although his testimony was not entirely clear, to the extent that Mr. Weiss's suggested on cross examination that Qwest need not engage in any research and development or that such activities provide no benefits to Qwest's wholesale offerings, *see* Tr. 1593-95 (Weiss Cross), the suggestion is simply wrong. In short, as Ms. Gude points out in her rebuttal testimony, "[i]f technology designs, solutions, and improvements were not evaluated and integrated into Qwest's network and service offerings, retail *and wholesale* offerings would become antiquated in short order." Ex. Qwest-27 (Gude Reb.) at 12 (emphasis added). The CLECs have not (indeed, cannot) contradict this nearly self-evident fact, and Mr. Weiss's attempt to shift all of the costs associated with these critical activities to retail accounts cannot stand.

IV. The Recurring Rate for the Unbundled Loop

A. Qwest's LoopMod Produces a Just and Reasonable Rate for the Unbundled Loop.

As discussed above, Qwest's LoopMod develops investment for the subscriber loop and drop wire based largely on information and data specific to Arizona relating to engineering loop designs, vendor prices, and placement costs. The key components of LoopMod are the design of feeder, the distribution design, and several cost-driving inputs relating to the placement and utilization of plant and equipment. LoopMod uses reasonable, realistic designs and inputs to produce a level of loop investment that is clearly within a range of reasonableness when compared to the results of other cost studies and Qwest's actual experience building loops.

LoopMod produces per-loop investment of approximately $884, compared to Qwest's actual investment of $1,053 per loop. By comparison, when the HAI model is adjusted to include inputs similar to those that are used in LoopMod, it produces loop investment of $872. The Benchmark Cost Proxy Model ("BCPM"), which was jointly developed and sponsored by Sprint, BellSouth, and U S WEST for use in proceedings relating to funding for universal service, produces loop-related investment ranging from $896 to $957. And when the FCC's Synthesis Model is run with a combination of FCC inputs and inputs from LoopMod, it produces a loop investment of $787. Ex. Qwest-1 (Buckley Dir.) at 9-10. These figures stand in sharp contrast to the plainly unrealistic total loop investment of $442 that the HAI model produces. Ex. Qwest-29 (Fitzsimmons Reb.) at 26-27. The reasonableness of the loop investment that LoopMod produces is a function of the model's use of network designs and inputs that reflect how engineers would actually design and build a forward-looking network in the real world in Arizona.

1. LoopMod's Feeder Design

Feeder is the main facility that runs from a central office to a DA. It typically consists of a large copper cable or fiber facility. If the facility is fiber, it is used to connect electronics at the central office with electronics at a location on the feeder route. Feeder cables often are placed within conduit, and they are designed to permit periodic reinforcement. Ex. Qwest-1 (Buckley Dir.) at 4.

Distance from the central office and population density are the key cost drivers in developing loop investment. The level of investment for feeder plant is affected directly by the amount of distance that exists between a serving central office and an end user. Longer distances require more feeder to reach a customer and, therefore, more investment. High population density provides for greater economies of scale. For example, high density allows the use of larger cables. *Id.* at 3.

In establishing feeder design, LoopMod uses an economic mix of copper and fiber facilities based on user-selected breakpoints. The breakpoints determine the distances at which the model transitions between different technologies and placement assumptions. The model analyzes each route in each Arizona wire center to determine the amount of demand on the route and the distance that the demand is from the central office. The model uses the information specific to each feeder route in conjunction with the breakpoint between copper and fiber to size the electronics and cables that are required. *Id.* at 5.

The design inputs for feeder determine the distance breakpoints for placing outside plant in conduit systems or by burying the plant. The model allows the user to employ different placement costs to reflect the differences in costs and activities associated with placing plant in urban areas as compared to rural areas. In particular, the model uses the types of trenching activities that are appropriate for more densely populated areas to place buried feeder in urban areas. For rural areas, the model assumes extensive use of the relatively low-cost method of placing cable. *Id.*

After LoopMod determines the feeder plant that will be used with each route, it determines the appropriate quantities for each type of equipment and the length of cables. Upon determining all of the plant requirements for the feeder portion of the network, the model applies cable-sizing factors to the demand on the feeder routes to select the appropriate cables. The model then develops investments for the total feeder plant and divides the total investment by the working lines to determine an amount of feeder investment per line. *Id.* at 5-6.

The default maximum distance for copper feeder in LoopMod is 12 kilo-feet, meaning that at 12,000 feet from the central office LoopMod changes from using metallic cable for loops to using digital loop carrier ("DLC"), fiber-based cable technology. Through the testimony of Mr. Weiss in which he adjusts this input, the Joint Intervenors attempt to demonstrate that the logic of LoopMod is flawed. Ex. AT&T/WorldCom-8 (Weiss (5/18/01) Dir.) at 33-41. However, Mr. Weiss' analysis does not lead to that conclusion at all.

As mentioned, the LoopMod model allows the user to vary the breakpoint between copper and DLC. Mr. Weiss ran the model with the maximum copper distance set at 9,000 feet. In addition, he ran the program with the distance set at 8, 10, and 11 kilo-feet. He asserts that the changes in the cost results – a reduction in loop cost of 0.30 percent with the breakpoint set at 9,000 feet, for example – were less than his experience led him to expect. *Id.* at 35. However, the result that he obtained is not surprising and does not in any way demonstrate that the logic of LoopMod is flawed. The reason for the minimal change in costs that Mr. Weiss observed is that changing the copper/fiber breakpoint only affects the costs for loops that were served on copper and that are now served on DLC. Because those loops are at or near the point where the costs are the same for both the copper and the fiber solution, the cost difference from changing the breakpoint is very small. Ex. Qwest-2 (Buckley Reb.) at 20.

The unsurprising nature of the result that Mr. Weiss observed is confirmed by conducting the same type of analysis on the HAI model. If one changes the maximum copper feeder distance from 9 kilo-feet to 12 kilo-feet (a 33 percent increase), the cost changes from $10.10 to $10.00, a 1 percent decrease. This result shows that the percentage change in maximum copper feeder distance is virtually meaningless in estimating the cost of loops. What is important is the change in the cost of the affected circuits and the percentage of affected circuits. When changing from 12 kilo-feet to 9 kilo-feet, both of these are fairly small values. Thus, the impact on average loop cost is minimal. *Id.* at 20-21.

Equally meritless is Mr. Weiss' assertion that LoopMod is flawed based on an analysis he performed that involved changing the cable sizes that the model uses. In his analysis, Mr. Weiss made adjustments to the cable sizing factors for both feeder and distribution. Once again, he stated that he would have expected the results to change more than they did. In fact, changing the cable sizing factors properly has very little effect on the average cost of the loop. First, the change only affects the relatively insignificant cable material cost and does not affect the far more significant costs of placement and trenching. Second, the change in cable sizing only affects cables that are on the cusp of one cable size versus another. For example, a demand of 70 lines divided by an 80 percent sizing factor yields 87.50 for the cable selection calculation. The LoopMod program will select a 100 pair cable. If the sizing factor is changed to 85 percent, the result will be 82.35, and the program will still select a 100 pair cable. In this situation, there is no cost impact due to the factor change. As long as the demand is less than 80 percent of the next larger cable (i.e. 79 line demand is less than 80 percent of the 100 pair cable), a shift from an 80 percent sizing factor to an 85 percent sizing factor is unlikely to impact costs at all. Mr. Weiss' conclusion is based on a basic misunderstanding of how LoopMod, and HAI for that matter, function. *Id.* at 21-22.

2. LoopMod Uses Real-World Distribution Designs.

Distribution plant consists of smaller cables that connect to the feeder plant at a Serving Area Interface ("SAI") or cross-connect box. As the name implies, these cables distribute pairs from the feeder plant to the customer locations. In most cases, the distribution cables are buried directly into the ground. A small percentage of the distribution cables are placed through the use of aerial plant, although the use of aerial plant has generally been on the decline in recent years. Ex. Qwest-2 (Buckley Reb.) at 4.

LoopMod's distribution designs rely upon actual, forward-looking architectures that Qwest uses in its networks. The guidelines for these architectures conform to the industry "serving area concept" design. The distribution area is a concise geographic area. It has a single interface point and typically serves 200 to 600 locations. The distribution cabling is a single gauge and is free of multiple assignments. The primary pairs are permanently assigned to a location and are cut off beyond the assignment point. LoopMod incorporates five distribution designs or density groups. *Id.* at 6-7.

These designs represent: (1) high rise buildings, (2) multi-building / multi-tenant scenarios, (3) single family with standard lot sizes, (4) single family with larger lots and (5) rural serving areas. LoopMod maps each individual Arizona DA to one of the Density Group ("DG") designs based on the size of the DA (area in square miles) and information relating to the size and type of terminals included in the DA. LoopMod also uses the data relating to the area of DAs to adjust the data relating to cable length for the distribution designs that are oriented by lot size (DG3, DG4 and DG5). The adjusted distribution designs reflect, therefore, the unique density that exists within each DA. *Id.* at 8.

After the model processes each DA, it weights the DA investments together based on their proportionate share of total working lines. By using this weighting, the actual Arizona-specific occurrence of distribution designs is reflected in the loop investments. The investments for the distribution plant are added to the feeder investments to determine the total outside plant investments. To arrive at the total investment for an unbundled loop, the model also adds investments associated with loop unbundling at the central office. *Id.*

Mr. Weiss asserts that the distribution design in LoopMod is not a least-cost approach, but he provides no evidence in support of that statement. He also offers the incorrect claim that the design does nothing more than replicate Qwest's existing network. Ex. AT&T/WorldCom-8 (Weiss (5/18/01) Direct) at 42-43. His criticism fails in several important respects.

The main cost driver in distribution plant design is density -- in other words, how much cable is required to pass all the customers. Larger lots require more cable. Smaller lots require less cable. LoopMod uses actual network DA data relating to density to adjust the distribution designs, not to replicate the embedded network, as Mr. Weiss claims. Ex. Qwest-2 (Buckley Reb.) at 24.

LoopMod begins with standard designs that allow the model to recognize the impact of common areas, cul-de-sacs, and other real world aspects of distribution plant construction. The model then applies a multiplier based on the individual DA densities to adjust the cable lengths in the standard design. In other words, LoopMod uses the network DA data to incorporate the unique densities of the actual distribution areas. These real-world considerations are an important attribute of the model, not a flaw, as Mr. Weiss claims. *Id.*

In contrast to LoopMod, the HAI model relies on either a branch and backbone cable design for distribution or the so-called minimum spanning tree approach to designing cable. These approaches fail to account for the significant affect that density has on distribution plant and investment. Thus, instead of replicating the existing network, as Mr. Weiss claims, LoopMod's distribution design properly relies on the densities of DAs to produce more accurate estimates of distribution investment than the HAI model produces. *Id.* at 24-25

3. LoopMod Uses Reasonable Values for the Key Inputs that Drive Loop Investment.

a. Cable Placement Costs

Cable placement costs are the costs of placing cable in the ground or on poles. These costs, along with the costs of splicing and other labor-related activities, are the largest component of outside plant costs. On average, more than 60 percent of Qwest's total investment in buried cable is related to the cost of placing the cable. Ex. Qwest-1 (Buckley Dir.) at 11.

The new version of LoopMod that Qwest has presented in this proceeding recognizes the use of contractors to place cable in the buried environment. The activity costs contained in the program are taken from the current network contracts with vendors who perform placement of buried plant in Arizona. In addition, this version of LoopMod disaggregates placement costs by Density Group and by Feeder-Urban versus Feeder-Rural to reflect the impact that density has on the placement methods that an engineer would choose. Accordingly, each of the categories of buried plant (Density Group 1 (DG1), DG2, DG3, DG4, DG5, Feeder-Urban and Feeder-Rural) has its own placement activity matrix, and therefore, reflects the percentage of trenching, boring, cut & restore asphalt, etc. that is reasonable for the associated density. The placement activities by density group are set forth in Exhibit RJB-3 to Mr. Buckley's direct testimony. *See* Ex. Qwest-1 (Buckley Dir.).

Trenching involves digging a trench, placing the cable directly into the trench, and back-filling the trench. The plowing method places cable by directly plowing it into the ground without digging a trench. Boring involves the use of equipment that literally bores cable through the ground in situations where, for example, cable must pass underneath a road, a sidewalk or a yard. The advantage of directional boring is that it avoids the costs and disruption that arise from tearing up roads, sidewalks, yards, and other structures. Cut & restore involves placing cable by digging up roads, yards, and other structures and then restoring those structures after the cable has been placed. *Id.* at 11-12.[17]

The density of an area is the primary factor that determines the placement method that LoopMod uses to place cables. For example, if engineers are placing buried cable in a low-density area along a county road with few obstacles, it is very likely that the construction crew will be able to plow the cable. In a new subdivision, before curbs, gutters and landscaping are

[17] LoopMod includes subcategories that further differentiate these activities. For trenching, LoopMod identifies different costs for trench and backfill, rocky trench and hand dig. For plowing, LoopMod includes different costs for standard plowing, rocky plowing and plowing with hydro/broadcast seed restoration. The cut and restore category has different costs for concrete, asphalt, and sod. Ex. Qwest-1 (Buckley Dir.) at 11-12.

placed, trenching machines can be used for standard trench and backfill placement. Once the density increases (e.g. a mature suburban neighborhood), however, engineers must use placement activities, such as boring, that do not damage streets, sidewalks and landscaping. If boring is not used, then engineers must use the cut & restore technique. *Id.* at 12.

The frequency of the different placement techniques that are used across the density groups in LoopMod is driven, in large part, by the fact that LoopMod is designed to estimate the cost of building a replacement network to provide service to all of Qwest's existing Arizona customers. In developing the forward-looking cost of a replacement network designed to serve all customers, a TELRIC model must recognize the world as it currently exists. In other words, with a replacement network, outside plant facilities often will have to be placed in business and residential areas that are fully developed – around or under streets, driveways, fences, sprinkler systems and landscaping. This reality of TELRIC modeling is recognized by Qwest and by the Joint Intervenors. *See, e.g.*, Tr. at 1360-61 (Denney Cross).

Navigating the natural and man-made obstacles in the environment requires the use of special construction techniques, such as cut & restore asphalt or concrete, boring, cut & restore sod, and hand trenching. While these techniques increase the cost of placing the cable, they are a necessary reality in building a replacement network. At the same time, however, LoopMod recognizes extensive use of low-cost placement techniques, such as cable plowing, where the density of an area allows engineers to use those methods. Ex. Qwest-1 (Buckley Dir.) at 14. The model also includes the relatively low-cost use of aerial plant to the same extent that that type of plant is used in Qwest's network today. *Id.* at 18.

In considering the proper mix of placement activities, it is important to recognize the cost trade-offs that come with a model that is designing a replacement network. On the one hand, modeling a replacement network will lead to relatively higher placement costs than would be incurred if a model were only adding capacity to an existing network, since a replacement network, unlike a growth network, requires substantial placing of facilities in areas that are already developed. On the other hand, modeling a replacement network leads to lower costs than would occur with a growth network because a growth network would include the diseconomies of longer loops and feeder cables sized to serve only the new lines that are being added to the network. *Id.* at 16.

LoopMod contains the economies of the latest technologies and cables sized to serve the total demand. It also includes the universe of loop lengths, not just those placed for the lines added to the network. To maintain consistency of assumptions, though, LoopMod recognizes that placement costs will be different in mature, developed areas than they are in new growth areas. These variables must be treated in a manner that is internally consistent in order for a cost model to produce meaningful results. For example, one cannot assume the cost to install plant in a new area while including the shorter loop lengths for the existing customers. *Id.* at 17.

The Joint Intervenors' and Staff's criticisms of LoopMod's assumptions relating to placement activities and costs are factually inaccurate and also fail to recognize the relationship between modeling a replacement network and the types of placement activities that are appropriate for a cost estimate. As a pure factual matter, Mr. Dunkel on behalf of Staff is incorrect in claiming that LoopMod uses directional boring and cut & restore methods for 60 percent of the distribution cable length that is included in the model. The accurate figure is that LoopMod uses boring, cut & restore concrete, cut & restore asphalt, and cut & restore sod for 41 percent of the distribution cable length. It is not unrealistic, as Mr. Dunkel claims, to expect cable replacement projects to use either boring or some sort of cut & restore method to place cable in mature neighborhoods. Because of the significant costs and disruption that result from digging up and repairing yards, sidewalks, and streets in mature neighborhoods, boring is a very efficient practical placement method for these areas. *See* Ex. Qwest-23 (Overton Dir.) at 14.

The practical efficiencies of using boring are confirmed by the real-life experiences from Omaha, Nebraska and Bismarck, North Dakota that Mr. Buckley describes in his testimony. *See* Ex. Qwest-1 (Buckley Dir.) at 20-21. In the Omaha Broadband Trial, construction crews were required to use directional boring to place more than 65 percent of the new facilities in developed areas. Similarly, approximately 50 percent of the 220 miles of buried plant that was placed by a cable television company in Bismarck involved the use of boring. Further, observations of AT&T Broadband's large rebuild of the former TCI cable television network reveal that AT&T is relying extensively on hand-dig, missile, and directional boring techniques. *Id.* at 21-22.

Tellingly, the Joint Intervenors' testimony is devoid of any real-life references to placement techniques that have been used in actual construction projects. Indeed, AT&T refused to provide any information in discovery about the placement methods that AT&T Broadband is using in its rebuild of the TCI network. Instead, the Joint Intervenors rely on Mr. Weiss who endorses the placement methods assumed in the HAI model even though, as he acknowledges, he has never reviewed the inputs and assumptions in the HAI model to determine if they are reasonable. Tr. at 1514-17 (Weiss Cross).

More telling than Mr. Weiss' uninformed endorsement of this assumption from the HAI model is the candid reference in his testimony to the fact that the actual amount of boring that Qwest has used in Arizona, as reported by Qwest's construction director for Arizona, is between 20 and 30 percent. Ex. AT&T/WorldCom-8 (Weiss (5/18/01) Direct) at 25. This amount of boring, which is conservative because it did not occur in the setting of a replacement network, confirms the reasonableness of LoopMod's assumption that overall, boring will be used for 26 percent of cable placements. Tr. 195, 242 (Buckley Cross, Redir.) Further, the testimony of Ms. Torrence, who has actual outside plant experience in Arizona, confirms the reasonableness of LoopMod's assumption. As she explained, directional boring is used extensively in mature, developed areas, since it avoids disruption to the environment and, as a result, often is the least-cost approach. In addition, municipalities throughout the country, including Scottsdale, for example, are increasingly requiring the use of less invasive placement techniques like boring to avoid disruption to roads and other infrastructure. *See* Tr. at 889-90 (Torrence Sum.).

Finally, Mr. Dunkel correctly refers to the industry practice of placing plant prior to the construction of streets and homes in new subdivisions. Unfortunately, the number of lines in new sub-divisions is a small fraction of the total lines included in the TELRIC replacement models. The vast majority of those lines are located in areas that are already built. Putting new technologies in these locations requires building around and through the landscaping and streets that currently exist. Mr. Dunkel's advocacy of placement methods that are appropriate for new subdivisions is inconsistent with the other inputs to the models and will produce a number that is neither forward-looking nor embedded. The costs produced by Mr. Dunkel's adjusted inputs will not provide any meaningful data for use in setting TELRIC-based rates. Ex. Qwest-2 (Buckley Reb.) at 15-16.

b. Assumptions Relating to Cost Sharing

Cost sharing refers to the sharing of cable placement costs among multiple utility companies. Structure includes poles for aerial cable, conduit systems for underground cable, and trench for buried cable. For instance, in Arizona, Qwest owns poles on which the power company attaches its cables. In addition, Qwest attaches its cables to poles owned by the power company. Agreements such as this allow each company to avoid the cost of building pole structures and thereby, reduce costs. In new subdivisions, where several facilities (cable television, telephone and power) are being placed at the same time, trenching activity can be coordinated and the trenching costs can be shared among the different providers. Sharing is a viable tool in the limited circumstances where multiple providers are placing outside plant at the same time in the same area or where, in the case of poles, the structure is accessible at any time. Ex. Qwest-1 (Buckley Dir.) at 24.

To share in placing buried cable, there must be a need for multiple providers to access a certain area at approximately the same time. In the TELRIC studies, a major portion of the network is in areas that currently have power and cable television. For those areas, a rebuild of the network will not involve sharing among multiple facility providers, since the other providers already have their facilities in place. The rebuilds in Omaha and Bismarck, mentioned earlier, yielded minimal trench sharing. In addition, there are certain placement techniques, such as plowing and boring, for which the placement of multiple cables simultaneously is not technically feasible or practical. Even pole lines have separation and clearance requirements that may preclude attachment to an existing structure. *Id.* at 24-25.

LoopMod assumes that the telephone company will pay 50 percent of the costs of placing aerial cable, 80 percent of the costs of placing buried cable, and 95 percent of the costs of placing underground cable. *Id.* at 25-26. These inputs assume that the opportunity to share will occur primarily in undeveloped areas where a developer will provide the trench at no cost to the company. In developed areas or areas where there is not a developer, the company will bear the cost of trenching, and there will be little opportunity to share. The reasonableness of these assumptions is confirmed by Qwest's actual experience with cost sharing. *See* Ex. Qwest-23 (Overton Dir.) at 9-10; Tr. at 888-89 (Torrence Sum.).

Data from Qwest's buried placement records for the years 1995 to 1999 demonstrate that Qwest has been able to share trench for approximately 18 percent of the buried sheath footage placed. Ex. Qwest-1 (Buckley Dir.) at 27. These data likely overstate the level of sharing that should be expected in a replacement network, since they reflect placement activities in a growth environment. Thus, LoopMod's assumption that 20 percent of the costs of placing buried facilities will be paid by other utility companies is conservative. *Id.*

In determining the appropriate values for cost sharing, it is necessary to ensure that the assumptions underlying these values are consistent with other assumptions in the cost model. For example, since both LoopMod and the HAI model assume that there is only one carrier serving Qwest's current demand, it would be inconsistent to assume cost sharing with other telecommunications providers. Indeed, it is highly unlikely that any other carrier will build a second ubiquitous telecommunications network that would permit cost sharing on the placement of plant to the degree that the HAI model assumes. In fact, in many areas, it is very doubtful that any other companies will even build a land-based network. AT&T recognized this reality in a filing with the FCC when it stated that "[c]apital costs to build a second traditional wireline network are prohibitive." *Id.*

c. Plant Mix

Plant mix refers to the percentages of cable facilities that are buried, placed in underground conduit, and placed on telephone poles. Conduit systems are typically used in areas where there are multiple cables and where there is a need for easy access to the cables. Areas that have high population densities are likely to rely substantially on underground conduit systems for placing cables. In areas that are less densely populated, placing cables through trenching and plowing is common. The use of aerial cable has declined in recent years because this type of cable is subject to a higher percentage of maintenance problems due to its exposure to weather, rodents, and vandalism. In addition, some municipalities and homeowner groups are requiring or encouraging the use of buried plant for aesthetic reasons. Ex. Qwest-1 (Buckley Dir.) at 28.

The LoopMod design designates underground placement for all cable within certain distances of the central office. The distances vary by size of wire center. This design reflects the fact that density decreases more rapidly in smaller wire centers than in larger wire centers. The distance breakpoints for underground to buried feeder cable are: Very Small wire centers - 1,000 feet, Small wire centers - 7,000 feet, Medium wire centers - 14,000 feet, and Large wire centers - 20,000 feet. For the remaining plant mileage, LoopMod uses an aerial percentage input to split the cable between buried and aerial. The default input for aerial is 14 percent. Based on that input, if the model develops 1000 miles of cable beyond the underground breakpoint, 140 miles of that cable is assumed to be aerial. *Id.* at 28-29.

The aerial percentage that LoopMod uses is based on a Qwest-wide summary of cable sheath miles in service. The data are separated by the type of placement (aerial, building, underground, buried and submarine) and by fiber versus copper. Data from an August 2000 report shows that aerial comprises 13.8 percent of the total sheath miles for aerial and buried cable. The percentage for December 1996 was 14.5 percent, which demonstrates that the use of aerial cable is generally decreasing and that it is highly unlikely that a network rebuild would result in an increase in aerial plant. *Id.* at 29.[18]

d. Fill Factors

Fill factors, or utilization factors, represent the relationship between the capacity of plant and the amount of the plant that is used. The feeder cable fill inputs to LoopMod represent a maximum desired level of utilization at the point in time when the cable is placed. Additional capacity in a cable arises from the application of a fill factor and from selecting discrete cable and equipment sizes. For example, a location that has demand for 60 working pairs would select a 100 pair cable based on the following calculation. Demand (60 lines) divided by sizing factor (80 percent) equals 75 pair requirement. The next larger cable would be a 100 pair facility. The effective fill would actually be 60 percent (60 working lines divided by 100 available pairs). The methodology is the same with Digital Loop Carrier ("DLC") equipment. Ex. Qwest-1 (Buckley Dir.) at 30.

In LoopMod, the default sizing factor for both cable and DLC systems is 80 percent. The line cards for the DLC systems are sized using a 90 percent factor, as they can be more readily reinforced than cables and DLC systems. *Id.*

LoopMod does not have a separate, identifiable fill factor for the the distribution design. Instead, the model assumes that a living unit will have two pairs or three pairs, depending on the

---

[18] In the hearing, Mr. Denney stated that Qwest's ARMIS Reports indicate that a higher percentage of aerial plant is in place in Qwest's Arizona network. However, Mr. Denney acknowledged that the ARMIS figure that he reported only included copper plant, and the percentage of aerial facilities would decrease if fiber plant were included. In addition, the figure that Mr. Denney presented included so-called C-wire or aerial wire that, as he acknowledged, was placed in the past only to reach single locations in highly rural areas and that he does not believe is forward-looking technology. Tr. at 1461-63 (Denney Cross).

density group in which the living unit is located. The model sizes distribution cable to reflect the assumption relating to the number of pairs in a living unit. The program develops a total investment for each distribution area and divides that by the number of working lines. Thus, the fill is implicit in the calculation and is not a separate. This approach is consistent with how engineers actually design distribution networks. *Id.*

LoopMod's approach of installing two or three cable pairs per living unit is based on the fact that it is less costly to place multiple pairs at once than it is to add additional facilties only when demand for them arises. A two- or three-pair design allows Qwest to respond to demand for additional pairs, regardless where the demand exists in a neighborhood, with little additional investment and without the disruption to a customer's premise that comes with reinforcing facilities. In addition to being economically efficient, this approach to building distribution plant is consistent with the goal of providing service on demand and minimizing held orders.

Mr. Weiss' recommended change to a fill factor of 0.6667 for use in LoopMod's distribution network violates sound engineering practices. In Arizona, there are approximately 1.7 working lines per residence. Ex. Qwest-1 (Buckley Dir.) at 32. Given this rate of additional line take, a fill rate of 0.6667 coud be achieved only through a distribution design that provides less than two pairs per site. Even as far back as 1982, AT&T itself advocated installing at least two pairs per living unit as a standard engineering practice. Ex. Qwest-2 (Buckley Reb.) at 7. Because demand for additional lines has increased since then, Qwest's network architecture now uses three pairs per site in single-family subdivisions. Thus, Mr. Weiss' proposed distribution fill would violate current and past engineering standards relating to the number of pairs to install per living unit. *Id.*

Mr. Weiss claims that his adjustment to 0.6667 fill would still allow access to three pairs per site. However, with a three pair per site design and a 0.6667 fill, Mr. Weiss is assuming a second line take of more than 100 percent. *Id.* In fact, Mr. Weiss is unrealistically assuming that the rate of second line takes in Arizona will be seven times greater than it actually is. *Id.*

Mr. Weiss acknowledged that his recommended fill factors for LoopMod are not based on any data that he has evaluated relating to the utilization rate of any carrier's distribution network. He also did not conduct any analysis of the frequency of additional line takes in Arizona or inquire about the distribution fill factors that his clients have experienced in their networks. Nor are there any calculations or work papers that support Mr. Weiss' purely impressionistic view of this issue. Tr. at 1525-30 (Weiss Cross).

4. The Grooming Costs that are Associated with Unbundled Loops

Grooming is the process that Qwest must perform to separate individual unbundled loops from Digital Loop Carrier ("DLC") systems. DLC systems use high bit rate circuits (DS-1 or OC-3) to transport multiple low bit rate circuits from the remote electronics to the central office. When a CLEC orders an unbundled loop that is carried on integrated DLC ("IDLC"), grooming is necessary so that the loop can be terminated on an intermediate distribution frame and cross-connected to a CLEC's equipment. Grooming equipment is not necessary for copper loops or loops derived from universal DLC systems. Ex. Qwest-2 (Buckley Reb.) at 18-19.

Qwest's proposed grooming rate is appropriate and proper because Qwest has accounted for the fact that all loops do not need grooming. Because grooming is only necessary for loops that are derived from an IDLC system, the grooming costs Qwest has proposed include a reduction to reflect that, although they apply to all unbundled loops, they only occur on the loops modeled as IDLC derived loops. In Arizona, LoopMod assumes that 44 percent of the loops are on IDLC. The grooming investments are multiplied by 44 percent, and this reduced grooming investment amount was used to develop the cost for grooming. *Id.*

The stand-alone cost for 2-wire unbundled loop grooming is $1.59 per loop. *Id.* at 3. This charge does not apply to the UNE-P elements and resale loops because these circuits utilize the Qwest switch and do not need to be cross-connected to CLEC collocation equipment. *Id.* at 19.

B. The HAI Model does not Produce a Just and Reasonable Rate for the Unbundled Loop.

The Joint Intervenors have sponsored the HAI model, version 5.2a, in support of their proposed rates for the unbundled loop and other UNEs. As the discussion below demonstrates, the HAI model has significant structured flaws and uses many inputs and assumptions that are unrealistic and do not comport with standard engineering practices. The model significantly understates the cost of UNEs and, therefore, should not serve as the basis for the Commission's pricing discussions. If the Commission decides to rely on the HAI model for any purposes, it should adjust most of the major cost-driving inputs that the model uses.

1. The History of the HAI Model Demonstrates the Unreliability of the Model.

A brief history of the HAI model proves the model to be highly unreliable. More than ten major versions of the model have been released since September 1996. Each new version was required because of the significant errors in the earlier versions of the model. AT&T filed version 2.2.2 in September 1996 throughout Qwest's 14-state region, including Arizona. Qwest uncovered numerous flaws in the model, including the fact that the model provided approximately one-half of the sheath miles necessary to reach the customers that Qwest served. Ex. Qwest-29 (Fitzsimmons Reb.) at 24-25. In February 1997, the sponsors of the model released version 3.0, which included a total redesign of the distribution section of the model. Just three weeks later, the sponsors introduced release 3.1 to correct significant errors. However, that release was also plagued by errors, including incorrect road cable calculations, incorrect application of placement costs, omission of subfeeder routes required to serve certain CBGs, and omission of underground and buried trenching costs. Id. In an attempt to correct some of those errors, the sponsors introduced release 3.1 update less than two months after release 3.1.

In July 1997, the sponsors released version 4.0 "preliminary," but that version had numerous interface errors. The sponsors replaced it within three weeks with updated release 4.0.

In December 1997, the sponsors issued release 5.0 of the model and, not long thereafter, version 5.0a and then a revised version of 5.0a. HAI 5.0a was the current version of the model by the close of 1998 when a sharp decline in the use of cost models in state proceedings began. Id. at 25.

The sponsors have now presented cost estimates based on HAI 5.2a. This version is very different from the model that the Commission considered when it set rates for UNEs in 1998. While the model has undergone substantial change, at least three critical elements have remained constant. First, the model continues to use a seriously flawed method for grouping customers into distribution areas and building plant to them. Second, the model still uses the same inputs that this Commission, other state commissions, and the FCC have repeatedly rejected and discredited in many decisions issued over the past five years. Each of these inputs artificially reduces costs. Third, the model produces unrealistically low cost estimates that cannot be validated by any real-world experience.

The discussion that follows addresses these flaws in the model, each of which renders the model unfit for use by the Commission.

2. Flaws in the HAI Model's Design of the Distribution Network

The costs of building the distribution portion of the network are a significant portion of the overall costs of building a replacement network. Flaws in the design of a cost model's distribution network will have a direct and material effect on the amount of investment that is included in a model and on the overall cost estimates that a model produces. There are two fundamental flaws in the design of the distribution network that is included in HAI 5.2a, each of which leads to a completely unreliable estimate of the costs of building the distribution portion of the replacement network.

First, the distribution areas that the model uses as the foundation for determining the amount of distribution plant and investment to include are based on customer location data from 1997 and, therefore, fail to account for the significant growth in customer locations that has occurred in Arizona over the past four years. Second, the model calculates distribution distances through the use of an unproven, unexplained, and demonstrably unreliable graphing methodology instead of relying upon a real-world design that produces enough distribution to reach all customers.

a. The Distribution Areas in the HAI Model are Based upon Proprietary Information that is not Publicly Available.

The sponsors of the HAI model have emphasized the importance of basing a cost model on publicly available information that is open to scrutiny and that is capable of being validated. *See, e.g.*, Tr. at 1351 (Denney Summary). The sponsors claim that their model meets this criterion in that all of the inputs and data that are used in the model are publicly available. *Id.* However, a review of the methodology that is used to create the distribution areas, or customer clusters, that are included in the model tells a different story.

The distribution areas in the HAI model are based upon highly proprietary information in the possession of a third party that even the sponsors of the HAI model have not seen. The sponsors of the HAI model are asking the Commission to take it on faith that this proprietary information is accurate and, further, to assume that an outside vendor used this information to create proper, realistic groupings of customers into distribution areas. This method of cost modeling is hardly "open." Equally important, as demonstrated below, there is clear evidence that the proprietary distribution areas that the outside vendor created are not accurate, since they fail to account for the thousands of new customer locations that have appeared in Arizona since 1997.

The design of the distribution network in the HAI model is a critical component of the model, since a substantial amount of the investment that the model includes is related to distribution. The model's distribution design revolves around clusters of customers that are the equivalent of distribution areas. The model builds feeder plant to the clusters and then extends distribution plant within the clusters in a theoretical attempt to reach customers. As Douglas

Denney, the sponsor of the HAI model, acknowledged, there is a direct relationship between the manner in which the clusters are formed and the amount of both distribution and feeder plant and investment that the model includes. Tr. at 1361-62 (Denney Cross). Errors in creating the clusters in the form of improperly grouping customers together, as Mr. Denney also acknowledged, will have a direct effect on the amount of investment for distribution and feeder that the model includes. *Id.* Accordingly, the accuracy of the cost estimates that the HAI model produces depends substantially on the accuracy of the customer clusters that are used in the model.

The sponsors of the model relied on an outside company, TNS, located in Pennsylvania to create the clusters of customers that are used in HAI 5.2a. TNS created the clusters without any involvement by the sponsors of the model and then handed them over to the sponsors who inserted them into the model. *Id.* at 1363. TNS deems the data underlying the clusters and the actual creation of the clusters to be highly proprietary. *Id.* at 1375-76. Thus, no one from the Joint Intervenors, including Mr. Denney, has seen the data that TNS used to create the distribution clusters. *Id.* at 1373-74. And, of course, the data are not part of the record in this case, therefore, making it impossible to evaluate the clusters that TNS handed over to the sponsors of the model.[19]

To create the clusters, TNS apparently relied upon two other companies, MetroMail and Dunn & Bradstreet, that provided addresses for residential and business customers for whom addresses were available. *Id.* at 1363-64. Significantly, the addresses that these companies

---

[19] Prior to the hearing, the Administrative Law Judges ruled in connection with Qwest's motion to compel that AT&T should produce the TNS data in discovery. AT&T never produced the data but, instead, offered to pay a small portion of the substantial costs that Qwest would have incurred for a site visit to TNS or for an undefined "remote hook-up" to TNS. It was never clear what access Qwest would have been given through this costly venture. Since it is AT&T's burden, not Qwest's, to obtain and produce the data underlying its cost study, Qwest declined AT&T's offer, particularly given the costs that were associated with the offer.

provided to TNS for customers in Arizona were only as of 1997. *Id.* at 1380. As a result, the clusters that TNS created do not include any customers that appeared after 1997. In addition, even when TNS is successful in identifying some actual locations of customers as they existed in 1997, TNS abandons those actual locations when it creates the clusters. Thus, while the model's sponsors proclaim that the model uses actual customer locations, in actuality, TNS disperses customers throughout the clusters without regard for the customer's actual locations. *Id.* at 1367-69.[20]

In sum, the clusters that form the foundation of the HAI model's distribution design are based on undisclosed, proprietary data and are not open to scrutiny; were developed using outdated customer location data from 1997; and do not reflect the actual locations of customers.

b. The Significance of the HAI Model's Failure to Account for the Growth in Customer Locations that has Occurred in Arizona Since 1997.

As Mr. Denney acknowledged, Arizona has been among the fastest-growing states in the country in recent years. Tr. at 1383 (Denney Cross). New developments and communities have been built in many areas of the state, including, for example, in North Phoenix, Scottsdale, Anthem, Peoria, Buckeye, and areas east of Apache Junction in Metropolitan Phoenix. Consistent with the level of growth that has occurred in the state, there has been an increase of approximately 20 percent in Qwest's line counts – almost 500,000 lines – for Arizona since 1997. *Id.* at 1389. To accurately estimate the amount of investment that is needed to serve Qwest's current demand in Arizona, a cost model must include the investment in feeder, distribution, and

---

[20] Mr. Denney asserts incorrectly that TNS was able to identify actual addresses for 77 percent of the customer locations in Arizona and that, as a result, 77 percent of customer locations are "geocoded." Ex. AT&T/WorldCom-3 (Denney Dir.) at 20. This figure fails to account for the fact that the data relating to customer locations that TNS used to create the clusters ends as of 1997 and fails, therefore, to account for the thousands of new customer locations that have appeared over the past four years and for which TNS does not have addresses. Tr. at 1391-92 (Denney Cross). If these new locations are included in the calculation of TNS' success rate for geocoding, as they should be, the success rate is significantly less than 77 percent.

other facilities that is needed to reach the new customer locations that are reflected by this sizeable increase in line counts.

Because the TNS distribution clusters that the HAI model uses are based upon customer location data from 1997, they necessarily do not include the thousands of new customer locations that have been established in Arizona over the past four years. *Id.* at 1381-82 (Denney Cross). In fact, while the geographic reach of Qwest's network has expanded considerably since 1997 as the result of new developments and communities, the geographic coverage of the HAI model's network has actually shrunk. Mr. Denney conceded this fact, acknowledging that the geographic area covered by the clusters that are used in the current version of the model is less than the area that was covered by the clusters that were used in Version 5.0a of the model. *Id.* at 1386 (Denney Cross). He admitted further that the neither TNS nor the sponsors of the model has increased the size of the distribution clusters to account for the new customer locations that have emerged since 1997. *Id.* at 1390-91 (Denney Cross).

As a result, the HAI model fails to include the substantial investment in distribution, feeder, and other facilities that is needed to reach new customer locations in places such as those listed above. Mr. Denney attempts to defend this approach by stating that "when customers spring up where other customers are, you don't need to add extra distribution plant out there to reach those customers." *Id.* at 1382 (Denney Cross). The obvious flaw in this assertion is that new customers often do not locate where existing customers already are but, instead, locate in new developments and new communities where there is not any pre-existing plant or facilities. The reality is that Qwest has built distribution plant and other facilities in many new developments in Arizona to serve new customer locations.

The HAI model is wholly unrealistic in assuming that the new customer locations that have arisen in Arizona since 1997 have uniformly appeared where existing customers are located. The sponsors' failure to include the investment needed to reach customers in new developments and communities contributes significantly to the model's substantial understatement of the cost of building a replacement network. The model's omission of this investment is particularly significant, since new developments typically are farthest from Qwest's central offices and the customers in these areas often are the most costly to serve. Tr. at 237 (Buckley Redir.).

c. The HAI Model Uses an Unproven and Unreliable Method for Building Distribution Plant.

To determine the amount of distribution plant and investment to include in the 1997-based TNS clusters, the HAI model uses a theoretical, unproven mathematical "graph theory" that the sponsors refer to as the minimum spanning tree function or "MST." This approach reduces the amount of plant and investment that the model includes, and does so without any demonstration by the model's sponsors that the use of a graph theory to build distribution plant actually results in enough distribution plant to serve existing demand.

The MST is a theoretical lower limit on the distances that are required to reach a number of points. It is a mathematical method used to estimate the distances required to connect customer locations as if they were dots on a blank page. It is not a method that any telecommunications engineer would ever use to design a distribution network. In the real world, customers are not on a blank page, and distribution networks must be designed around lakes, rivers, buildings, highways, and other natural and man-made obstructions. Accordingly, there is little resemblance between a real-world distribution network and the lines created by the MST function to connect dots on a page. Ex. Qwest-29 (Fitzsimmons Reb.) at 35-36.

The Joint Intervenors have not established that there is any meaningful relationship between the HAI model's MST estimates and the actual distribution distances that are required to connect actual customers. As Dr. Fitzsimmons explains, the evidence that does exist indicates that the MST approach understates the amount of distribution that is needed to serve customers, particularly in high density, urban areas. In a cost proceeding in Minnesota, Stopwatch Maps compared the amount of distribution produced by the HAI model's MST function to serve the rural town of Montevideo to the amount of distribution that would actually be required to serve that town in an efficient, real-world network. That analysis concluded that a real-world network would require about 20 percent more distribution plant than the MST function produced. In higher density areas in Minnesota, Stopwatch Maps concluded that a real-world network would require twice as much distribution distance than was produced by the MST function. *Id.* at 38-39. These results raise serious concerns about the ability of the MST function to estimate with any accuracy the amount of distribution plant needed to serve customers.

The Joint Intervenors acknowledge that they have not performed any comparison of the amount of distribution produced by the MST function with a real-world analysis of the amount of distribution that would be needed to serve Arizona customers. Tr. at 1394-95 (Denney Cross). Moreover, as the sponsor of the HAI model, Mr. Denney was unable to explain the "graph theory" that the HAI model uses with the MST function:

> Q. You may have said this in your answer, and if you did, I apologize, but what graph theory or graph principle underlies the MST that's used in the HAI model?
>
> A. I mean, graph theory is just a branch of study in mathematics, and I don't know – I don't know details about it. I personally haven't studied graph theory.

Id. at 1398 (Denney Cross).

The significance of the concerns about the legitimacy of the MST function is demonstrated further by the distribution distances that the HAI model produces when the MST function is not used. With the MST function turned off, the HAI model adopts a distribution design that at least attempts to simulate a real-world network. According to Mr. Denney, using that design, the HAI model produces nine percent more distribution distance for Arizona than is estimated by the MST function. *Id.* at 1396 (Denney Cross). The Joint Intervenors have no explanation for this significant disparity that their own model produces.

Further, it is noteworthy that using the MST function instead of the distribution design that is built into the model leads to a particularly pronounced effect of reducing distribution plant and investment in the urban areas where most CLECs are targeting customers. *Id.* Given the almost exclusive focus of the Joint Intervenors on customers in urban areas, it is surely not a coincidence that they are now utilizing the MST function in all states in which they are presenting the HAI model. *Id.* at 1394 (Denney Cross). Without real-world validation of the MST function and even a meaningful explanation from the Joint Intervenors of the theory underlying MST, the Commission should not accept this theoretical method of designing distribution plant.

3. The HAI Model uses Unrealistic Inputs that are not Supported by Engineering Testimony and that State Commissions have Consistently Rejected.

The HAI model is built upon inputs and assumptions that are designed to minimize costs at the expense of the quality of the telecommunications network it purports to build. As shown below, the model is replete with examples showing how its developers consistently chose to minimize costs regardless whether the cost-saving assumptions they selected were consistent with sound engineering practices.

While Mr. Denney acknowledges that many of the critical inputs in the HAI model are engineering in nature, he is not an engineer, and the Joint Intervenors did not present an engineer who could substantiate any of the model's engineering inputs. Although Mr. Denney stated that Mr. Weiss would be able to address the model's engineering inputs (Tr. at 1353-54), Mr. Weiss made it clear that he did not analyze the inputs to the model to determine if they are reasonable. Tr. at 1514-17 (Weiss Cross). There is little evidence in the record that supports the HAI model's engineering inputs, and, as discussed below, this Commission, other state commissions, and the FCC have consistently rejected those inputs.

Dr. Fitzsimmons' testimony establishes that if several of the critical assumptions in the HAI model are changed to bring them into line with prior orders from this Commission and the FCC and with the realities of building a telephone network in Arizona, the model produces a cost estimate for the unbundled loop of nearly $20.00. The discussion that follows demonstrates the flaws in the HAI model's critical inputs and shows that correcting those inputs leads to results that are within a range of reasonableness.

Mr. Denney and Dr. Fitzsimmons agree on which of the assumptions and inputs are critical to the Commission's analysis of the HAI model: the treatment of digital access lines, the percentage of placement costs for outside plant that the telephone company can share, plant mix, the costs of placing buried plant, network operations expenses, expenses relating to general support assets, and overhead expenses. Ex. Qwest-29 (Fitzsimmons Reb.) at 35; Tr. at 1400-01 (Denney Cross). In addition, if the Commission relies at all on the HAI model to develop a cost estimate for the unbundled loop, it should correct for the model's use of the MST function, its understatement of the average distance of a drop wire, and for improper depreciation values associated with drops, network interface devices ("NIDs"), and serving area interfaces ("SAIs"). The HAI model's treatment of these and other key assumptions and inputs is addressed in the discussion that follows.

a. The MST Function

For the reasons discussed above, the significant flaws in the HAI model's distribution design are reason enough for the Commission to reject the model in its entirety. However, if the Commission decides to rely on the model, it should order the Joint Intervenors to turn off the MST function. Doing so will result in a distribution design that is based on the HAI model's attempt to simulate a real-world distribution network. While that network still would be seriously flawed because it would not properly account for new customer locations that have been established since 1997, it at least would correct for the understatement of distribution plant that use of the MST causes. Disengaging the MST function will increase the HAI model's per line loop investment by $31 and the per month unbundled loop cost by $0.76. Ex. Qwest-29 (Fitzsimmons Reb.) at 39.

b. The Treatment of Digital Access Lines

The proper method for treating digital access lines in cost studies has received considerable attention from state commissions and the FCC. The issue concerns whether digital access lines should be included in a cost study on a channel-equivalent or on a physical-pair basis. For example, earlier versions of the HAI model treated digital access lines on a channel-equivalent basis, meaning that DS1s were included in the model as 24 physical lines and DS3s were included as 672 physical lines. By treating DS1s and DS3s in this manner, the HAI model added tens of thousands of "lines" to the narrowband unbundled loops over which the cost of building loops was spread. The large increase in the number of lines over which loop costs were spread led to an artificial reduction in the per loop cost that the HAI model produced.

In response to this issue, the FCC and a majority of state commission's in Qwest's region ruled that access lines should be treated on a physical-pair basis, not as channel-equivalents. *Id.* at 40. As the FCC explained, "[s]ince 24 communications channels can be carried by two pairs of copper wires, the number of copper cables required to carry digital traffic is computed by dividing the number of digital channels by 12."[21] As this statement by the FCC implies, there are sound, logical reasons for treating access lines on a physical pair basis. The only reason to consider DS1s and DS3s in an estimate of the cost of narrowband loops is the possibility that there may be some economies of scale associated with placing the cables for DS1 and DS3 circuits at the same time as cables for narrowband loops. This impact is commensurate with the number of *physical* cables for DS1 and DS3 service that traverse the same routes as narrowband

---

[21] Tenth Report and Order, *In the Matter of Federal-State Joint Board on Universal Service;Forward-Looking Mechanism for High Cost Support for Non-Rural LECs*, CC Docket Nos. 96-45 & 97-160, FCC 99-304 (rel. Nov. 2, 1999) at ¶ 100 ("*Tenth Report and Order*").

loops. Special access lines are created with electronics installed on physical loops; there are *not* 24 physical loops in a DS1. Including only the physical cables for DS1s and DS3s captures any economies of scale that result from placing special access lines.

In response to the many rulings that rejected the HAI model's treatment of access lines, the model's sponsors have modified HAI 5.2a in an attempt to treat access lines on a physical-pair basis. Tr. at 1403-04 (Denny Cross). However, they have not fully corrected the problem. The Joint Intervenors' run of the HAI model in this case still includes digital business lines on a channel-equivalent basis. For example, ISDN Primary Rate service uses DS1 technology to provide a low-cost substitute for Centrex and PBX services. The Joint Intervenors' run of the HAI model treats the DS1s that are used for this service on a channel-equivalent basis. Ex. Qwest-29 (Fitzsimmons Reb.) at 40-41

There is no legitimate reason for treating business access lines on a channel-equivalent basis while treating all other access lines on a physical-pair basis. As Mr. Denney confirmed, the decision to correct the HAI model's treatment of access lines was driven in part by the fact that the installation of a DS1, for example, involves placing only two physical pairs in the ground, not 24 pairs. Tr. at 1404 (Denney Cross). This reasoning applies with equal force to the DS1s and DS3s that are used with business access lines. As Mr. Denney acknowledged, just as with other access lines, Qwest places only two pairs in the ground, not 24 pairs, for the DS1s that are used with business access lines. *Id.* at 1407 (Denney Cross). Thus, Mr. Denney agreed that treating business access lines on a pair-equivalent basis "would be consistent with what I did with the special access lines." *Id.* at 1408 (Denney Cross).

Dr. Fitzsimmons' sensitivity analysis establishes that substituting physical line counts for the channel equivalents that the HAI model uses for business access lines increases the loop investment per line by $16 and the per month loop cost by $0.42. Ex. Qwest-29 (Fitzsimmons Reb.) at 41 If the Commission relies upon the HAI model, this adjustment to the model should be made.

c. The HAI Model's Cost Sharing Assumptions

As discussed above in connection with LoopMod, a cost model's sharing assumptions reflect the fact that in some cases the cost of placing cable facilities will be borne by more than one utility company. Qwest assumes that it will bear 50 percent of the cost of placing aerial plant, 95 percent of the cost of placing underground plant, and 80 percent of the cost of placing buried plant.

In addition to the evidence cited earlier, LoopMod's sharing assumptions are supported by the testimony of Qwest's Rachel Torrence, who has had significant experience placing outside plant, including experience as an outside plant designer in Arizona. Tr. at 885-86 (Torrence Sum.).[22] As Ms. Torrence testified, as a general matter, it is only possible to place cables jointly with other utilities in new developments and on existing poles. This is so for several reasons, including the necessity of coordinating the timing of placement, the differences in footprint between telephone facilities and other utilities' facilities, and the fact that certain methods of placement, such as the direct plow method, do not lend themselves to sharing. Relying on her extensive experience with actual cable placements in the field, Ms. Torrence elaborated on the timing difficulties that limit the ability of utility companies to place their facilities together: "The truth of the matter is that the construction schedules and customer priorities among utilities vary, and in many instances, conflict, and as such, it limits the opportunity to share any type of structure." Tr. at 888-89 (Torrence Sum.). The Joint Intervenors' own witness, Mr. Weiss, confirmed the accuracy of this real-world view of cost sharing, stating that "typically these companies plow in their facilities at totally different times, and sometimes they're not shared." Tr. at 1623-24 (Weiss Redir.).

---

[22] Ms. Torrence adopted the testimony of another Qwest engineer, James Overton.

In contrast to the realistic sharing assumptions that LoopMod relies upon, the HAI model starts with the assumption that, on average, Qwest will only be responsible for little more than *one-third* of the cost of placing distribution, feeder, and transport cables for a newly constructed network in Arizona. Ex. Qwest-29 (Fitzsimmons Reb.) at 42. The HAI modelers originally adopted the one-third value as a default value based on the simplistic view that there are generally three providers of utilities over similar types of facilities -- electric utilities, telephone, and cable -- and the modelers have refused to change this default value despite the overwhelming factual evidence that it does not reasonably reflect actual sharing percentages. *Id.* at 43-44.

The cost sharing assumptions in the HAI model have been uniformly rejected by state commissions throughout Qwest's region and by the FCC. For example, in contrast to the model's assumption that the telephone company will pay only one-third of the cost of placing buried cables, the FCC's Tenth Report and Order assigns between 100 percent and 55 percent of these costs to the telephone company, depending on the density zone. In the previous wholesale cost docket in this state, the Commission ordered a cost sharing percentage of 50 percent for all placement methods. *See* Ex. Qwest-29 (Fitzsimmons Reb.) at 48-49 (and citations therein). The Federal-State Joint Board on Universal Service recommended assigning 100 percent of plowing costs and 66 percent of the costs of most other types of placement to the telephone company. *Id.* In Colorado, where Dr. Fitzsimmons recommended that the telephone company bear 84 percent of the costs of buried placements, the commission agreed, stating: "We find . . . that [a]djusting the calculations of USWC witness Fitzsimmons for this [sharing] assumption . . . is reasonable." *Id.* The Iowa Utilities Board adopted the sharing percentage of 70 percent for both buried distribution and feeder plant. *Id.* Likewise, the New Mexico Commission assigned 70 percent of the placement costs for buried plant to the telephone company. *Id.*

The Joint Intervenors have not provided any meaningful support for the HAI model's structure sharing assumptions. They did not present an outside plant engineer who could testify whether the sharing assumptions made by the HAI model were realistic; their principal witness regarding the model, Mr. Denney, has no outside plant experience. Tr. at 1354-55 (Denney Cross). Their other witness who discussed cost model inputs in his testimony, Mr. Weiss, advocated cost sharing percentages different from those that are used in the HAI model and provided testimony that undermines the percentages in HAI.

For example, as noted above, Mr. Weiss stated that utility companies typically place their facilities at "totally different times." He also agreed with an instruction in AT&T's own "Outside Plant Engineering Handbook" that joint placement of facilities with power companies should be done only with distribution cables and service wire, "not for feeder or trunk cables." Tr. at 1554 (Weiss Cross); Ex. Qwest-33. Mr. Weiss elaborated on why AT&T likely has this policy, explaining that "the longer that you parallel a power line with a cable – with a copper cable – the worse is going to be the electromagnetic coupling between the conductor of the power company and the conductor of the telephone company."[23] He explained further that "from AT&T's perspective . . . [t]hey do not want their people involved in the public right of way necessarily with the power company doing these things, but that doesn't mean that the National Electric Safety Code prohibits it." Tr. at 1624 (Weiss Cross).

In addition to this testimony from the Joint Intervenors' own witness, the HAI model's cost sharing assumptions are contradicted by the model's heavy reliance on the plowing method for placing buried cable. The model assumes that the majority of buried distribution cable will be placed through the so-called direct plow method, which involves using a mechanical piece of equipment that literally pushes the cable into the ground. Tr. at 1423 (Denney Cross). This method of placement reduces placement costs because it avoids the costs associated with digging and back-filling trenches. However, with this method, placing facilities with other utility companies typically is not feasible, since the machinery that is used places one facility at a time.

---

[23] Mr. Weiss conditioned this statement by expressing his view that this concern does not exist for fiber cable. Tr. at 1625 (Weiss Cross).

Ex. Qwest-23 (Overton Dir.) at 11. While it may be legitimate to assume significant use of this low-cost method of placing buried cable, it is clearly wrong to assume, as the HAI model does, that the telephone company will pay only 33 percent of these costs on the ground that there will always be two other utility companies sharing in this placement method. Qwest's evidence that cost sharing does not occur with this method of placement is unrefuted. The HAI modelers cannot have it both ways – if they choose to rely extensively on this low-cost method of placement, they cannot also assume against the weight of evidence that these already-reduced placement costs will be shared with two other utility companies.

The modelers also attempt to have it both ways through their assumption that cost sharing will take place with other telephone companies. This assumption is reflected in the HAI Inputs Portfolio, which states that "accelerated facilities based entry by CLECs into local telecommunications markets will expand further future opportunities for underground structure sharing." This position is inconsistent with the fact that the HAI model includes all of Qwest's access lines and assumes that only one carrier will serve all of those lines. As Mr. Denney acknowledges, the assumption that just one carrier will serve all demand results in significant economies of scale that reduce the model's cost estimate for unbundled loops. Tr. at 1359 (Denney Cross). It is patently inconsistent to assume that only one carrier will serve existing demand and to then assume that that single carrier will be able to share the placement of facilities with other carriers. Ex. Qwest-29 (Fitzsimmons Reb.) at 45

Even the witnesses who have sponsored the HAI model have recognized this inconsistency. In another proceeding, AT&T witness, John Klick, stated unequivocally that "[w]e do not contend that sharing opportunities are induced by competition." *Id.* at 45. In this case, when asked about the inconsistency between these assumptions, Mr. Denney stated that the sharing percentages in the HAI model do not include sharing with other telephone companies: "These sharing percentages are based on the other utilities as their deviation (sic)." Tr. at 1416-17 (Denney Cross).

The unrealistic nature of the HAI model's cost sharing percentages is demonstrated by Ms. Torrence's testimony that in Arizona in each of the past five years, other utility companies have shared less than 20 percent of Qwest's placement costs for buried plant. Tr. at 888, 915-16 (Torrence Sum., Torrence Cross); *see also* Ex. Qwest-25 and tr. at 944-47 (Torrence Redir.). Equally telling is the fact that none of the Joint Intervenors provided any information or data about their actual experience with cost sharing. If the Joint Intervenors were able to share placement costs at levels anywhere near those assumed in the HAI model, they likely would have made that fact known. Their silence about their own experience is revealing.

Accordingly, if the Commission relies on the HAI model, it should reject the model's cost sharing assumptions and substitute those that are in LoopMod. As Dr. Fitzsimmons' sensitivity analysis demonstrates, replacing the cost sharing assumptions in the HAI model with a combination of some of the FCC's cost sharing assumptions and some of those that are used in LoopMod increases the HAI model's per loop investment by $101 and the monthly loop cost by $1.86. Ex. Qwest-29 (Fitzsimmons Reb.) at 50

d. Drop Lengths

The Joint Intervenors' run of the HAI model produces an average length for a drop wire of approximately 66 feet. This average length is unreasonably short and causes an understatement of the investment that is needed for drops.

Qwest has undertaken an extensive data collection process to determine average drop lengths within its region. Empirical evidence from a sample of thousands of drops across seven states reveals an average drop length of approximately 150 feet.[24] The HAI model uses national

[24] Engineers collected these data across seven states during site visits to customer premises. The average of 150 feet is calculated by capping long drops at a distance of 500 feet. Ex. Qwest-29 (Fitzsimmons Reb.) at 51 n.60.

default values for drop lengths that are less than *one-half* of the average length demonstrated by the Qwest study. Ex. Qwest-29 (Fitzsimmons Reb.) at 50-51.

While Qwest is able to provide region-specific, empirical data that support the average drop length in LoopMod and demonstrate the inaccuracy of the average length in the HAI model, the Joint Intervenors do not provide any meaningful evidence in support of the 66-foot drop length that they are advocating. They provided no evidence of actual drop lengths in any of Qwest's 14 states. Instead, they simply plugged the HAI model's national default lengths for drops into the Arizona run of the model and produced the average length of 66 feet. The Joint Intervenors do not address in any way whether it is appropriate to use an unexplained national default value for drop lengths in a proceeding that is intended to develop Arizona-specific costs and rates.

In fact, because Arizona and many other states in Qwest's 14-state region have a large percentage of highly rural areas, the average drop lengths in Qwest's states should be expected to be longer than any national average. As Mr. Weiss confirms, drop wires in rural areas are longer than drops in urban areas. Tr. at 1532 (Weiss Cross). Nevertheless, Mr. Weiss cites a national drop survey that Telcordia performed in 1983 in support of his proposed adjustment to the drop lengths that are included in LoopMod. That 18-year-old study, which reported a national average drop length of 73 feet, provides no support for reducing LoopMod's drop lengths, and it does not substantiate the use of the default lengths in the HAI model. Although he cited and relied upon the study, Mr. Weiss admitted that he had never seen it. Tr. at 1534 (Weiss Cross). He has no idea how the study was performed or whether it even includes any observations from Arizona or any of the other states in Qwest's region. Tr. at 1533-36 (Weiss Cross).

Accordingly, the best evidence of the average drop length for Arizona is Qwest's region-specific survey that reveals an average length of about 150 feet. If the HAI model is run with the conservative adjustment of doubling the model's existing average drop length -- from 66 feet to about 135 feet -- the per line loop investment increases by $19, and the monthly unbundled loop cost increases by $0.41.

e. Plant Mix

As discussed in connection with LoopMod, plant mix is the relative mix of aerial, buried, and underground facilities that are assumed by the model. Because aerial plant is less expensive than buried or underground plant, an overstated proportion of aerial facilities will result in an understatement of investment costs. Not surprisingly, the Joint Intervenors consistently overstate the proportion of aerial placement as an input to the HAI model.

The most reliable indicator for the proportion of aerial plant in a forward-looking network is the actual percentage of aerial facilities in Arizona. Today, Qwest uses aerial facilities for 17.5 percent of its cable; this is down from 18.6 percent in 1995. Ex. Qwest-29 (Fitzsimmons Reb.) 51. By contrast, the HAI models set a default value for plant mix that assumes aerial facilities for 25 percent of all placement in low-density areas to 85 percent in high-density areas. The weighted average of aerial plant for the HAI model in Arizona is 29.2 percent. Ex. Qwest-29 (Fitzsimmons Reb.) at 53. This is plainly an unrealistic view of the proportion of aerial cable that would be placed in a reconstructed network, particularly in light of the fact that the current trend is to reduce the aerial distribution that is in use.

Ms. Torrence testified about the appropriate mix of plant, especially in light of the decline in the use of aerial plant. There are a number of reasons for the recent decline. First, many people regard aerial plant as an eyesore. As Mr. Weiss succinctly described it, "[a]erial plant has connected with it a major drawback. You can see it." Tr. at 1542 (Weiss Cross). Second, as Mr. Weiss also acknowledged, municipalities are increasingly passing laws that prohibit the use of aerial plant precisely because it is unattractive. As he stated, "[m]ost states don't want – or most municipalities that I'm familiar with don't want to see the aerial plant. They'd rather see it buried or underground." *Id.* Third, because aerial plant is subject to the elements, it is much more prone to damage and outages than is buried plant. Ex. Qwest-23 (Overton Dir.) at 13-14.

Finally, because aerial plant is more susceptible to damage from the elements, the maintenance costs associated with this type of plant are high. *Id.*

AT&T's "Outside Plant Engineering Handbook" confirms these concerns about the use of aerial plant and, consistent with these concerns, states that "[b]uried plant is recommended as the first choice of providing outside plant (OSP) facilities beyond the underground network." Ex. Qwest-33 at 9-1. The Handbook identifies the potential for multiple problems arising from the use of aerial plant, providing as follows:

> 1. Existing aerial cables may experience some or all of the following, *making it advantageous to consider another type of construction*:
>
> a. In heavily wooded areas, lengthy service disruptions may result due to fallen tress.
>
> b. Excessive maintenance problems are sometimes experienced due to squirrels or other rodents causing sheath damage or building nests in splice cases.
>
> c. In areas where high winds are known to be a problem, wind-whipping of the cables causes them to wrap around themselves resulting in mechanical damage to the cable sheath.
>
> d. In areas where roadways exist, extensive damage to poles and cables can result from automobile accidents.
>
> e. In areas prone to lightning, damage to poles, cables, and hardware can result.

Ex. Qwest-33 at 3-4 and 3-5 (emphasis added). In addition to these considerations, the Handbook instructs that "[t]here may be a government or company policy dictating underground or buried facilities in certain size residential housing developments." *Id.* at 3-6. The Handbook states further that "[m]ajor highways often require the construction of underground or buried facilities for safety as well as aesthetic reasons." *Id.*

For these reasons, a forward-looking study should not assume significant use of aerial plant and certainly should not assume, as the HAI model does, that nearly one-third of all plant is aerial. Dr. Fitzsimmons' sensitivity analysis demonstrates that adjusting the plant mix in the HAI model to comport with the amount of aerial plant that is in place in Arizona today increases the model's per-line loop investment by $133 and the per-month loop cost by $1.48. Even this adjustment is conservative, since the use of aerial plant reasonably should be expected to decline on a forward-looking basis.

f. Placement Costs for Buried Distribution

Qwest addressed the issue of placement costs and activities in detail in the previous section of this brief relating to LoopMod. There are, however, a few points specific to the HAI model relating to this issue that bear emphasis.

In Hatfield 2.2.2, the average placement cost for buried distribution was almost $5.00 per foot. In the current model, the weighted average placement cost in Arizona is $2.65 per foot. Ex. Qwest-29 at 53-54. There is no reasonable explanation for this sharp decrease in the model's placement costs. Indeed, as discussed earlier, to reduce placement costs, the model improperly assumes that the majority of buried distribution will be placed through the direct-plow method. While use of this method is clearly appropriate in some areas, such as low-density areas, the HAI model overstates the extent to which the plowing method can be used. This overstatement fails to recognize that building a replacement network under scorched node conditions requires placing facilities in the existing environment – around buildings, roads, driveways, rivers, and other man-made and natural obstacles. To correct this input, the model should assume geater use of cut & restore placement and directional boring. Doing so would result in placement costs that would be at least somewhat closer to those that the sponsors of the Hatfield model originally advocated.

Using Qwest's weighted average cost for buried placement of $4.60 per foot in the HAI model increases monthly loop investment by $61 and the per-month loop cost by $1.37. *Id.* at 54.

g. Network Operations Expenses

The network operations factor includes the expenses associated with providing network administration, testing, plant operations, administration, and engineering. The HAI modelers assume that this expense -- the costs to operate the network -- will fall by fifty percent in a forward-looking TELRIC world. Ex. Qwest-29 (Fitzsimmons Reb.) at 55. However, AT&T has withdrawn its original basis for the assertion that this reduction will occur. *Id.* at 55-56 Moreover, the reduction in employees performing network operations functions, implicit in the proposed reduction, could have a negative impact on service quality. *Id.* at 56-57.

In fact, the evidence supports the opposite conclusion -- namely, that network operations expenses will not fall significantly in a forward-looking TELRIC world. Qwest's network operations expenses in Arizona declined significantly between 1995 and 1997. Since 1997, network operations expense per line has remained relatively flat. *Id.* at 57. This pattern demonstrates that Qwest has made significant changes that have reduced network operations costs, but that these reductions in cost cannot be replicated every year, or even over a series of years. Because the HAI model bases network operations expenses on Qwest's year 2000 data, the model has already captured the cost reductions that Qwest has achieved since 1995. Applying an arbitrary 50 percent reduction on top of these cost savings results in a gross understatement of network operations expenses. *Id.*

In addition to the lack of support for a fifty percent reduction, as Dr. Fitzsimmons notes, AT&T's analysis also is based on a confusion of future costs with forward-looking costs:

> Forward-looking costs are based on today's best technology and operating practices, not technology and operating practices that will be unavailable until some indefinite time in the future. It is inconsistent with the proper interpretation of the long run concept to estimate today's costs based on productivity gains that Qwest may achieve over the next eight years. This policy would always have Qwest pricing below its current costs.

Ex. Qwest-29 (Fitzsimmons Reb.) at 56.

Accordingly, the HAI model's 50 percent reduction of Qwest's network operations expenses is insupportable. Correcting this flawed input increases the HAI model's monthly unbundled loop cost by $1.36.

h. Overhead

The HAI model uses an overhead rate of 10.4 percent, which AT&T states is based upon its own 1994 overhead. *See* HAI Inputs Portfolio App. C, at 174. However, AT&T's overhead factor is based on a ratio of overhead expenses to revenue that is inappropriate for incumbent LECs such as Qwest. In particular, as an interexchange carrier, AT&T collects a large amount of revenue from its customers that it passes on directly to local exchange carriers in the form of access charges. Because these revenues are *not* generated by AT&T's network, they are not properly attributable to AT&T in the calculation of overhead. *See* Ex. Qwest-29 (Fitzsimmons Reb.) at 58-59. As set forth in the rebuttal testimony of Qwest's witness Dr. Fitzsimmons, at least one state commission has highlighted this flaw. *See id.* at 59 (citing and quoting from Iowa Utilities Board decision). Yet the model's sponsors continue to insist on presenting a model which includes inputs that plainly have no application here.

The structural flaws of the model's overhead input are exacerbated by the errors in calculation and analysis committed by AT&T's cost model witness Mr. Denney. As described in the rebuttal testimony of Ms. Gude and Dr. Fitzsimmons, on a number of occasions, Mr. Denney's attempted defenses of the model's overhead factor suffer from repeated and fundamental calculation errors. *See, e.g.*, Ex. Qwest-27 (Gude Reb.) at 40-42 (highlighting Mr. Denney's miscalculations and failure to properly apply the very formula that underlies HAI's overhead factor); Ex. Qwest-29 (Fitzsimmons Reb.) at 60-61 (describing similar miscalculations and misapplications of fundamental formulas and economic analysis). Mr. Denney did not dispute that his analysis suffered from the errors identified by Ms. Gude and Dr. Fitzsimmons. As Ms. Gude points out, correcting some of these errors results in significant increases in the model's overhead factors. *See* Ex. Qwest-27 (Gude Reb.) at 42 (chart showing overhead factor increases from 10.4 percent to 15.1 percent when correcting the "simple 'booked' average factor").

The overhead factor included in the HAI here is not grounded in real-world conditions facing an incumbent LEC such as Qwest and is fundamentally suspect given the basic miscalculations made by those charged with supporting it in this proceeding. It should be rejected.

i. Expenses Associated with General Support Assets

General support expenses relate to the cost of furniture, office equipment, general purpose computers, motor vehicles, garage work equipment and other equipment. Ex. Qwest-29 (Fitzsimmons Reb.) at 58. The HAI model multiplies the general support investment and expenses by "Allocator" fractions, which reduce the general support costs by over fifty percent. *Id.* For example, a total Operation General Support Allocator" that reduces the costs by 50.33 percent reduces some categories of general support expenses. Ex. Qwest-27 (Gude Reb.) at 43. An "Office Worker General Support Allocator" that reduces the costs by 54.22 percent reduces other categories of general support expenses. *Id.*

These HAI "Allocators" are arbitrary and completely unsupported. Nowhere in the HAI documentation are these "Allocators" sufficiently explained or justified. Ex. Qwest-27 (Gude Reb.) at 43. The brief discussion relating to general support costs in the HAI documentation states that a portion of the general support costs is assigned to computer operations and corporate operations and that the remainder of the cost is assigned to UNEs. *Id.* Since the portion of costs assigned to customer and corporate operations are not captured anywhere in the model, the effect of this "allocation" is an arbitrary 50+ percent reduction in general support costs. *Id.* The HAI model estimates general support investments and expenses by applying a factor based on 2000 ARMIS data to investment generated by the model. *Id.* Thus, these originally estimated general support costs are consistent with the network and services modeled by HAI; any further arbitrary reduction is inappropriate. *Id.* at 43-44.

Correcting for the HAI model's application of this allocator to support costs increases the monthly unbundled loop cost that the model produces by $0.87. *See* Ex. Qwest-29 (Fitzsimmons Reb.) at 58.

j. Depreciation Values for Drops, NIDs, and SAIs

The depreciation values that the HAI model uses for SAIs, NIDs and drops are inappropriate because they are much longer than those for comparable investments and do not reflect the depreciation parameters that were authorized by this Commission for the type of investment required. Ex. Qwest-29 (Fitzsimmons Reb.) at 61; Ex. Qwest-27 (Gude Reb.) at 38. Although the HAI model appears to isolate investments associated with NID, SAI and Drop, the capital carrying costs for the investments should still reflect the depreciation parameters for the proper investment accounts as they were authorized by the Commission in its most recent order relating to depreciation. Ex. Qwest-27 (Gude Reb.) at 38.

By segregating NID, SAI and Drop investments from other investments accounted for primarily as 45C, 52C and 5C in the following accounts: Account 2423 – Buried Cable Metallic, Account 2421 – Aerial Cable – Metallic, and Account 2422 – Underground Cable Metallic, the model employs carrying charge inputs that reflect different depreciation parameters. *Id.* The model uses an adjusted depreciation "projection life" of 19 years for NID, SAI and Drop instead of employing the Commission's designated depreciation life and related "adjusted projection life" values of 11.21 years for 45C, Account 2423 – Buried Cable Metallic; 9.45 years for 52C, Account 2421 – Ariel Cable Metallic; and 14.15 years for 5C – Account 2422 – Underground Cable Metallic. *Id.* This departure from Commission-approved depreciation parameters is a substantial, improper change from the lives that the Commission authorized. When Dr. Fitzsimmons used proper depreciation lives, the unbundled loop cost increased by $0.54. Ex. Qwest-29 (Fitzsimmons Reb.) at 61.

4. The HAI Model Is Not Amenable to Real-World Validation.

Without some form of external validation, a cost model is of questionable value and can be dangerously misleading. The key test for any cost model is its ability to represent reality. The Commission should not base the future of telecommunications service and competition in Arizona on a cost model that is not supported by experience in the real world. However, there is no experience in Arizona that supports the HAI model's proposed monthly loop cost per line of $10.10. In fact, using AT&T's input values for HAI 5.2a, the per line loop investment is only $442, Ex. Qwest-29 (Fitzsimmons Reb.) at 34, compared per loop with actual construction costs in Arizona that exceed $1,000. Ex. Qwest-1 (Buckley Dir.) at 9-10. Viewed from this perspective, Qwest's TELRIC investment cost estimate of $884, and even the HAI model's investment cost estimate when the model is run with corrected inputs and assumptions ($803), Ex. Qwest-29 (Fitzsimmons Reb.) at 34, show that the HAI model, run with AT&T's default inputs, cannot be validated in the real world.

Equally important, the engineering assumptions in the HAI model have not been – and cannot be – validated, even though severalof the most critical inputs in the HAI model involve engineering issues and judgments. However, the Joint Intervenors did not attempt to validate any of those inputs through testimony from an engineer. As discussed above, the engineering testimony that is in the record establishes that the HAI model's engineering assumptions and inputs are wholly unrealistic.

C. Staff's Analysis of Loop Costs is Inaccurate and Unreliable.

Staff witness, Mr. Dunkel, presented an analysis of unbundled loop costs that is demonstrably flawed. Mr. Dunkel reported that based on a run of the HAI model that used inputs from this Commission's prior Cost Order and inputs that the FCC used specifically to determine high cost funding for Arizona, he obtained an statewide average loop rate of $11.89 with sold exchanges removed and $13.21 with sold exchanges included.

However, in his surrebuttal testimony, Dr. Fitzsimmons demonstrated that Mr. Dunkel erred in the inputs that he used. Many of the feeder and distribution input values that Mr. Dunkel described as FCC values are actually default values from the HAI 5.0a model, which is not supported by any party in this proceeding. As a result, Mr. Dunkel's run of the HAI model does not provide meaningful information for consideration in this proceeding. Fitzsimmons Surrebuttal at 3-8. When the FCC's model is run with the appropriate FCC inputs, the resulting loop cost that is produced is $17.77. *Id.* at 7.

D. Sprint and Z-Tel Rely on Improper Comparisons and Principles for Determining a Just and Reasonable Rate for the Unbundled Loop.

1. Sprint

Sprint's criticisms of Qwest's proposed recurring loop rates are misplaced. Moreover, Sprint's conduct in the proceedings to establish the rate that it offers as a comparison to Qwest's proposed rate here belies its claim that Qwest's proposal is improper.

In attacking Qwest's proposed rate, Sprint's witness Randy G. Farrar relies on the rate established by one commission in only one of the eighteen states in which Sprint operates as an ILEC – Nevada. *See* Ex. Sprint-1 (Farrar Dir.) at 7; Tr. at 1734-35. Admissions made by Mr. Farrar on cross-examination demonstrate the impropriety of Sprint's reliance on the Nevada Commission's ordered rate. First, Mr. Farrar conceded, as he must, that in setting recurring loop rates in Arizona, the Commission should take into account the large rural territory served by Qwest in state. *See* Tr. at 1737-38 (Farrar Cross). Mr. Farrar admits that "the biggest driver of loop rates is access line density." *Id.* at 1737 (Farrar Cross).

Second, Mr. Farrar further acknowledged that "in excess of 90 percent" of Sprint's lines in Nevada are located in the state's urban area (Las Vegas) and that "none of [Sprint's] other 17 states have an urban area anything like Nevada." Tr. at 1736-37 (Farrar Cross). Indeed, Mr. Farrar underscored the unique nature of Sprint's Nevada situation when he stated at the hearing that "the biggest driver of loop rates is access line density, and we [Sprint] don't have any other territory that has access line density anywhere near that [*sic*] we have in Las Vegas." Tr. at 1737 (Farrar Cross). In short, it is no accident that Sprint chose to use rates ordered by the Nevada Commission in its attack on Qwest's proposals here. It is, however, equally clear that the attempted comparison simply is not meaningful considering the nature of Sprint's network there – where in excess of 90 percent of Sprint's lines lie in an urban area.

Moreover, Sprint's conduct in the course of the proceedings to establish the Nevada rate undermines its position here. It is important to note that in attacking Qwest's proposed rate, Sprint uses the *rate ordered* by the Nevada Commission for the most dense zones in the state ; it does not make its comparison based on the *rate Sprint proposed* in that proceeding, nor does it disclose the average rate adopted by the Nevada Commission. *See* Ex. Sprint-1 (Farrar Dir.) at 7 ("Qwest's proposed rate . . . is more than double the $10.23 rate adopted by the Nevada Commission in Sprint's Zone 1"); *see also* Ex. Qwest-35 (Nevada Commission Orders re: Sprint loop rates). As established on cross-examination, however, Sprint in fact opposed a rate of $14.46 proposed by AT&T in the Nevada proceeding, and the Nevada Commission in fact ordered an average rate in excess of $20.00. *See* Tr. at 1740-42 (Farrar Cross); *see also* Ex. Qwest-35 (Nevada Commission Orders re: Sprint loop rates). Thus, contrary to Mr. Farrar's assertion in his direct testimony that Qwest's proposed rate in Arizona "is more than double the rate originally proposed by Sprint" in Nevada (*see* Ex. Sprint-1 (Farrar Dir.) at 7), Qwest's proposed rate here appears to be in line with Sprint's proposals in Nevada and the average rate actually established by the Nevada Commission.

Finally, consistent with its position in Nevada, Sprint appears to concede that ILECs should be able to recover the actual costs of the facilities used to provide loops. *See* Tr. at 1743. And, whatever disputes Sprint may have with Qwest's proposed rates here, Mr. Farrar made clear on cross-examination that "Sprint does not, and did not, and never did support the Hatfield Model." Tr. at 1741-42 (Farrar Cross).

2. Z-Tel

On behalf of Z-Tel, Dr. Ford argues that the Commission must apply two standards in setting prices for UNEs. First, the Commission must set cost-based rates using TELRIC principles. Second, the Commission must set rates that are "conducive to competitive entry." Ex. Z-Tel-1 (Ford Dir.) at 8. Dr. Ford is half right. As discussed previously, although Section 252(d) of the Act *does* require state commissions to set cost-based rates for UNEs, there is no provision in the Act requiring state commissions to price UNEs in such a way as to foster competition.

Although Dr. Ford's first standard comports with the mandates of the Act, i.e. the Commission must set cost-based rates by applying TELRIC principles, the methodology suggested by Dr. Ford for arriving at cost-based rates is fundamentally biased and flawed. Dr. Ford argues that the application of TELRIC principles provides for a range of rates, and that the Commission should select rates from the lower part of the range in order to ensure a profit for new entrants. Ford Surrebuttal at 1. It would be inappropriate, however, for the Commission to set rates for UNEs following the methodology suggested by Dr. Ford.

It is the obligation of state commissions to set rates for UNEs that both: (1) ensure that productive assets of the ILEC are made available to competitors at cost-based prices; and (2) compensate the ILEC for the cost of providing UNEs. In other words, the role of the Commission is to set cost-based prices that are competitively neutral and unbiased. In order to fulfill its responsibility under the Act, the Commission must objectively estimate the "best" cost for each UNE. The established methodology for arriving at the "best" cost is to select one or more models and to select reasonable inputs for those models. This is the methodology that has been followed by the FCC as well as by this Commission in its earlier wholesale pricing docket. It is also the methodology followed by state commissions throughout the country. By applying the established methodology, the Commission acts objectively. By applying Dr. Ford's proposed methodology, i.e. selecting rates from the lower end of a range, the Commission will necessarily favor one type of competitor (non-facilities based) over another (facilities based).

The overall goal of promoting efficient innovation and investment in the telecommunications market can only be achieved if UNE prices both: (1) compensate the ILEC for the actual forward-looking cost of building and operating an efficient network; and (2) provide competitors with accurate pricing signals that will enable them to make efficient build-versus-lease decisions. Ex. Qwest-29 (Fitzsimmons Reb.) at 5. Dr. Ford is wrong when he concludes that "[t]he analysis is simple: lower UNE rates promote competition; higher UNE rates deter competition." Ex. Z-Tel-1 (Ford Dir.) at 8. Although rock-bottom prices for UNEs may jump-start competition in the short run, they will not promote efficient competition in the long run. Ex. Qwest-29 (Fitzsimmons Reb.) at 7. Rather, setting prices for UNEs that are below the costs that Qwest and other facilities based providers incur will disrupt the ongoing development of competition in Arizona.

As FCC Chairman Michael Powell recently noted:

> [G]overnment policy was a little too generous in incenting quick [business] models. . . I think we probably bent a little more in the direction of resale than facilities because everybody was really anxious to get competition. . . we have to do the hard medicine stuff now . . . [to] make sure that whatever competition does come is real and lasting.[25]

Ex. Qwest-29 (Fitzsimmons Reb.) at 9-10. Even Dr. Ford himself conceded at the hearing that setting UNE rates at inappropriately low levels would be detrimental to facilities based competition. Tr. at 1786-88 (Ford Cross).

---

[25] *Powell Blames CLEC Money Woes on Lenders, Bad Business Plans*, Part 2 of Powell's Interview Transcript, Edie Herman, Mary Greczyn, Communications Daily, May 23, 2001.

E. The Commission Should Adopt Rates for the Unbundled Loop that are Deaveraged Based on Wire Centers.

Through the rebuttal testimony of Ms. Million, Qwest proposed a new method for deaveraging UNE loops. Ex. Qwest-18 (Million Reb.) at 58-59. Previously, Qwest sought to deaverage loops by calculating loop costs at the wire center level through Qwest's LoopMod model and assigning wire centers to deaveraged zones based on costs. *Id.* at 57; Tr. at 751-52. Now, Qwest proposes to deaverage loops by calculating loop costs at the wire center level and assigning wire centers to deaveraged zones using an optimization program recommended by Mr. Denny and used in Washington and Minnesota. Ex. Qwest-18 (Million Reb.) at 58; Tr. at 751-52.

Under this new method, Qwest proposes to approach deaveraging in Arizona by grouping the two lowest cost wire centers (Phoenix Main and Tempe) into Zone 1 and using the deaveraging optimization program to determine the appropriate breakpoint between Zone 2 and Zone 3. Ex. Qwest-18 (Million Reb.) at 58-59. This results in the following costs, line counts and percent distribution of the lines for three deaveraged zones in Arizona:

Cost	Number of Lines	Percent of Lines
Zone 1 = $16.89	145,780	5.6
Zone 2 = $22.57	1,658,501	63.1
Zone 3 = $34.34	823,336	31.3

Statewide Average Loop Rate = $25.95

These costs and line counts are based on excluding the wire centers that have been identified as being for sale from the calculation. Ex. Qwest-18 (Million Reb.) at 59. These costs also do not include the grooming rate. Tr. at 754.

Qwest's new proposal is appropriate and reasonable and is a direct result of the comments and criticisms of the joint ntervenors. Qwest's proposal also demonstrates Qwest's attempt to reach a reasonable solution and accommodate the joint intervenors' demands. Qwest agrees with the Joint Intervenors that the methods of grouping wire centers by cost that were used by both the Washington and Minnesota Commission's are valid approaches to deaveraging. Ex. Qwest-18 (Million Reb.) at 58. Qwest also recognizes that the deaveraging optimization program that Mr. Denny advocates works the way he explained in his testimony. *Id.* Accordingly, Qwest's proposal satisfies the Joint Intervenors' concerns and should be accepted.

V. Nonrecurring Costs and Rates

A. Qwest's Nonrecurring Costs and Study Methodology

Nonrecurring costs are the one-time costs associated with establishing a service or providing a UNE. These costs typically arise from specific activities or transactions that Qwest must perform in response to a CLEC order for service or for a UNE. Qwest has presented its Enhanced Nonrecurring Cost Studies ("ENRC"), which is a collection of cost studies that estimate the nonrecurring TELRIC for all UNEs and interconnection services. The ENRC calculates nonrecurring costs for provisioning and installation activities based on time estimates and probabilities of occurrence of the tasks performed to accomplish each function. The time estimates and probabilities for each task are presented in detail in the ENRC workpapers that are attached to Ms. Million's Direct Testimony as Exhibit TKM-03. These estimates and probabilities are provided by engineers and product managers who have actual responsibility for performing the tasks and overseeing the products and services at issue. Ex. Qwest-16 (Million Dir.) at 26.

The ENRC calculates the direct nonrecurring costs for each UNE and interconnection service based on time estimates to perform tasks, probabilities that tasks will be performed, and labor rates associated with each job function. ENRC then applies expense factors to the direct nonrecurring costs to provide the TELRIC for each UNE and interconnection service. The final step involves an allocation of common costs to each nonrecurring cost element. *Id.* at 27.

The ENRC contains inputs based on Qwest's current experience in processing orders and provisioning network plant. The Qwest nonrecurring TELRIC studies identify the forward-looking, nonrecurring costs that Qwest is likely to incur in provisioning UNEs. These studies consider the actual processing and provisioning activities that are either in place today or scheduled to be implemented, rather than theoretical provisioning methods based on future hypothetical technologies or networks that are not currently deployed. The studies include changes anticipated by subject matter experts in processing and provisioning. They also include certain assumptions and expectations for mechanization based on the development of Operations Support Systems ("OSS") interfaces for use by the CLECs. If the studies use these assumptions, they produce results, as delineated in Exhibit TKM-03, that properly reflect the TELRIC principles. These results should be used by the Commission to set nonrecurring prices for UNEs and interconnection services. *Id.* at 27-28.

While the ENRC calculates the nonrecurring costs for most UNEs and interconnection services, it does not calculate the nonrecurring costs for collocation and line sharing, with the exception of line sharing installation, which is included in the ENRC. Those nonrecurring costs are developed separately and are addressed in later sections of this brief. In addition, Qwest has developed a separate cost study for the customer transfer charge ("CTC"), consistent with the decision in *U S WEST v. Jennings, supra*. The CTC study is cost-based and reflects the tasks that Qwest must perform in the Interconnection Service Center ("ISC") when an end-user customer switches from Qwest to another local carrier. The primary tasks relate to changing customer records to reflect the change in service provider. Ex. Qwest-16 (Million Dir.) at 62.

B. Responses to the CLECs' and Staff's Criticisms of the ENRC

The Joint Intervenors criticize Qwest's proposed nonrecurring charges on several grounds. Their criticisms reflect a lack of understanding about the tasks and processes that are required to provide access to provide interconnection services and access to UNEs and should be rejected.

1. The Joint Intervenors Rely on Unrealistic Assumptions Relating to OSS and Order processing.

Mr. Weiss recommends that Qwest adjust the assumption relating to the percentage of orders that Qwest receives electronically, asserting that all of the orders Qwest receives should be assumed to be electronic. This proposed assumption is wholly unrealistic and would clearly result in an understatement of Qwest's nonrecurring costs.

Mr. Weiss acknowledges that the CLECs, not Qwest, decide whether orders are submitted electronically or manually. Tr. at 1565-66 (Weiss Cross). A significant percentage of the orders that CLECs submit to Qwest are transmitted by fax. Mr. Weiss would ignore this reality and simply have the Commission deny Qwest the higher costs that are associated with processing orders that CLECs choose to submit by fax on the ground that manual orders are not "forward-looking." In arguing specifically that Qwest should be denied cost recovery for processing orders, Mr. Weiss ignores the fact that it is the CLECs that choose to submit orders by fax, and, therefore, it is the CLECs that impose the costs of manual processing on Qwest. Qwest is entitled to be compensated for these processing costs. In any case, Qwest has now assumed that for UNE-P and 2-wire loops, 85 percent of the orders flow through electronically. Qwest also has assumed additional increases in flow-through based on flow-through improvements that the company expects to achieve over the next year-and-a-half. Tr. at 849.

Mr. Weiss' unrealistic approach to order processing also is reflected in his assumptions relating to the types of OSSs that Qwest should provide to CLECs. As he explained during cross-examination, Mr. Weiss begins his analysis of issues relating to OSS with the assumption that instead of being required to provide CLECs with access to its existing OSSs, Qwest must provide access to OSSs that are completely mechanized. He asserts that this obligation exists regardless whether Qwest's existing OSSs can be fully mechanized. Further, while asserting that Qwest must meet a standard of full mechanization, Mr. Weiss does not identify any particular type of OSS that he believes would achieve this goal and acknowledges that his experience with OSSs is limited. Tr. at 1506-13 (Weiss Cross).

Mr. Weiss uses his flawed assumption to propose the elimination from Qwest's nonrecurring studies of the costs associated with UNE ordering and "associated plant record functions." He offers no explanation for the proposed removal of these costs, other than to state in a conclusory manner that these activities will be performed in an automated fashion by Qwest's OSS system. However, he is unable to identify any existing OSS system that can perform these tasks with this degree of automation.

2. The Joint Intervenors Would Improperly Deny Qwest the Recovery of Costs Associated with Disconnections.

Mr. Weiss also improperly advocates that the costs associated with disconnections be excluded from Qwest's nonrecurring rates. It is undisputed that Qwest incurs real costs to perform the tasks that are needed to disconnect customers from the carriers that are serving them. Qwest incorporates these costs into an initial nonrecurring charge because, as commissions have traditionally recognized, it is often difficult to collect disconnection charges from customers who no longer require service. Ex. Qwest-18 (Million Reb.) at 42.

The CLECs assert that with the business-to-business relationships that characterize ILEC-CLEC relationships, ILECs are not at risk of going uncompensated for the costs of disconnection. However, as the CLECs have emphasized in much of their testimony, the financial stability of a significant number of CLECs is in serious doubt, and there is, therefore, substantial risk that CLECs will not pay these and other legitimate costs. This unstable environment only heightens the need for up-front recovery of disconnection charges. *Id.* at 43. In any case, regardless of the timing of Qwest's recovery of these costs, it is wholly improper to deny Qwest recovery of these costs altogether, as Mr. Weiss proposes.

3. The Joint Intervenors' Proposed Reductions of the Time Estimates Included in Qwest's Nonrecurring Costs are Without Support.

Mr. Weiss asserts broadly that the subject matter experts who developed the time and probability estimates that Qwest uses in the ENRC overstated their estimates. He provides no support for this sweeping claim.

It bears emphasis that the experts who developed the assumptions for the ENRC are the very people who have responsibility for performing the nonrecurring tasks that are the subject of the nonrecurring studies. As people with hands-on experience performing these activities, they are well qualified to estimate times and probabilities. By contrast, while the Joint Intervenors Nonrecurring Cost Model ("NRCM") also relies on people who are described as subject matter experts, there is no evidence that any of those individuals has ever had responsibility for performing activities that are associated with interconnection and access to UNEs. Ex. Qwest-18 (Million Reb.) at 44-45. Indeed, while Mr. Weiss endorses the time and probability assumptions that the NRCM uses, he admits that he has never spoken to the people who developed those assumptions to determine how they derived them. Tr. at 1559-60 (Weiss Cross).

Mr. Weiss also specifically asserts that activities that are performed by the service delivery implementor in the ENRC are improperly included because they are also performed in the service provisioning process and, therefore, are duplicated. This assertion is factually incorrect. Mr. Weiss assumes incorrectly that the activities of the Service Delivery Implementation Group occur toward the end of the service delivery process and include verification that certain work has already been performed. However, the Service Delivery Implementor has overall coordination responsibility for service provisioning and performs activities throughout the service order provisioning process. The activity identified as "Verify Local Network Operations (LNO) Circuit," to which Mr. Weiss refers, is an abbreviated description for a number of different activities that the Implementation Group performs throughout the process of establishing service. Thus, contrary to Mr. Weiss' claim, the implementation activities do not occur at the end of the service delivery process and are not for the purpose of verifying that work has already been performed. Ex. Qwest-18 (Million Reb.) at 44.

4. The Commission Should Reject the Joint Intervenors' Request that Qwest Recover Nonrecurring Costs Through Recurring Charges.

Michael Hydock, a witness for the Joint Intervenors, urges the Commission to minimize recovery of costs through nonrecurring charges. Ex. AT&T/WorldCom-14 (Hydock Dir.) at 17. He suggests, for example, that Qwest should be forced to recover the cost of setting up a collocation space or a transport circuit for a competitor by means of monthly *recurring* charges, despite the fact that such charges represent one-time costs to Qwest. *Id.* at 18.

The recovery of nonrecurring costs by means of recurring payments spread out over time, however, presents a significant risk to Qwest. Consider the following example. A competitor comes into the market and incurs set up charges for a collocation cage. Qwest begins to recover the cost of the cage by means of recurring monthly charges spread out over a five-year period. The competitor then leaves the market in the second year. Qwest is left with no means of recovering the remaining sixty percent of the cost incurred for the cage. Tr. at 1679 (Hydock Cross). While some collocation equipment may be re-used by another competitor, there is no basis to assume this will always be the case. Ex. Qwest-8 (Fleming Reb.) at 44. In fact, experience suggests that abandoned collocation installations are not being reused. Of the 73 collocation cancellations in Arizona, only 11 have been assumed by another competitor. *Id.* When cross-examined on this topic at the hearing, Mr. Hydock acknowledged that the use of recurring payments to recover nonrecurring costs *does* present this type of risk. Tr. at 1680 (Hydock Cross).

As the FCC noted in its Second Report and Order:

> To the extent that the equipment needed for expanded interconnection service is dedicated to a particular interconnector, we believe that requiring that interconnector to pay the full cost of the equipment *up front*

> is reasonable because LECs should not be forced to underwrite the risk of investing in equipment dedicated to the interconnector's use, regardless of whether the equipment is reusable.[26]

In short, requiring Qwest to recover nonrecurring costs through a recurring charge will, in all probability, preclude Qwest from ever recovering many of these costs, a direct violation of the Act, which requires that incumbent LECs be compensated for the costs they incur in providing interconnection to their facilities. Ex. Qwest-8 (Fleming Reb.) at 45.

C. The Joint Intervenors' Nonrecurring Cost Model is Flawed and Should not be Used to Establish Nonrecurring Rates.

There are multiple flaws in the NRCM that the Joint Intervenors propose for nonrecurring rates. The model systematically omits a significant number of nonrecurring costs that Qwest will incur to provide interconnection services and access to UNEs. Further, for the limited number of nonrecurring costs that the NRCM does estimate, the model uniformly uses unrealistic assumptions relating to the nature of the activities that are associated with nonrecurring costs and, as a result, significantly understates the nonrecurring costs that Qwest's incurs.

In addition, the Joint Intervenors have not provided any back-up material that supports any of the assumptions in the NRCM. They have not provided any evidence to support the nonrecurring activities specified in the model, or the work times and probabilities that are applied to the activities. When the CLECs asked Qwest for supporting data for its time estimates, Qwest provided detailed back-up supporting the time and probability assumptions for every nonrecurring charge, including, in any many case, the identities of the experts who provided the assumptions.[27] When Qwest requested similar documentation from the Joint Intervenors relating

---

[26] Second Report and Order, *In the Matter of the Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, CC Docket No. 93-162, FCC 97-208 (rel. June 13, 1997) ¶ 33 (emphasis added).

[27] Response to ACC Request WD 4-122.

to NRCM, the Joint Intervenors simply referred Qwest to the NRMC documentation filed on CD-ROM with the model, which contains no detailed back-up.[28]

1. The NRCM Fails to Develop Costs for Many Nonrecurring Activities.

The limited number of rates that the NRCM develops do not cover the wide range of UNEs and services that CLECs have demanded and that Qwest has agreed to provide. While the brief descriptions in the NRCM make it difficult to determine the services and UNEs to which some rates would apply, it is clear that the model does not address many of the services that have been agreed upon in SGAT workshops. Ex. Qwest-18 (Million Reb.) at 54.

For example, the NRCM does not produce any nonrecurring costs or rates for entrance facilities, DS1 and DS3 trunk rearrangements, DS1 and DS3 channel regeneration, and loop installations. Tr. at 1572-73 (Weiss Cross). These are just a few examples of the many products and services for which the NRCM does not generate any costs or rates. If the Commission were to adopt the NRCM, there would be a significant gap in the nonrecurring rate structure. For this reason alone, the Commission should reject the NRCM.

2. The NRCM Fails to Account for the Functions that are Performed by Qwest's Interconnect Service Center.

Among the most significant flaws in the NRCM is the model's failure to include *any* costs associated with an interconnect service center. The model assumes that *no* service representative or order writer will *ever* be involved in processing an order. This amounts to 100 percent flow-through, an assumption that is totally unrealistic. As new generations of OSS and electronic interfaces are developed and become available, it is possible that manual intervention by ISC personnel will be reduced. However, since ISC personnel perform up-front tasks that support the processing of an order it is completely inappropriate to assume that such intervention will never

[28] Response to Qwest Request 1-70.

be required, even assuming some ultimate hypothetical view of systemization. Ex. Qwest-18 (Million Reb.) at 46-47.

Part of the ISC function is to provide a stopgap for orders that are submitted incorrectly and error out of the system. Although it is often mistakes on the part of the CLECs that cause these orders to error out, through their advocacy of the NRCM, the Joint Intervenors would eliminate the activities that Qwest performs in the ISC to correct these mistakes. Further, in Qwest's experience, no system is 100 percent infallible under all circumstances. Qwest's nonrecurring studies assume in many instances that 85 percent to 95 percent of the orders will be processed without the need for manual intervention from this group. In addition, for some UNEs such as DS1 and DS3 capable loops, the orders and activities associated with placing orders and coordinating with the CLECs are too complex to be performed in a mechanized fashion. These orders require activities by Qwest employees working in the ISC. *Id.* at 47.

The NRCM's elimination of the ISC also ignores the fact that many of the CLECs placing orders with Qwest do not have the sophisticated systems that AT&T or WorldCom employ for their end of the service order process. As recently as April 2001, Qwest was still receiving 24 percent of its orders from CLECs via fax in Arizona. *Id.* It would be a clear violation of the cost recovery provisions of the Act to require Qwest to process those manual orders and to deny recovery of the costs associated with that activity through a cost study that pretends the activities do not take place.

3. The NRCM Improperly Eliminates Nonrecurring Activities by Assuming that all Facilities for POTS Services are Dedicated.

By assuming that 100 percent of the facilities used for POTS type services are dedicated, the NRCM unrealistically assumes that there is no need to perform activities in the field, such as dispatching a technician to run jumpers. While this assumption may be appropriate for UNE-P where the service is dedicated, it is clearly inappropriate for the installation of new and additional lines. Because these lines are not dedicated, field activities are clearly required to install them. Ex. Qwest-18 (Million Reb.) at 48.

The assumption that all POTS-related facilities also conflicts directly with the HAI model's assumptions relating to the sizing of the loop. The HAI model includes sizing assumptions in its distribution cable that do not provide for dedicated additional lines. These non-dedicated lines would have to be installed by engineers performing the manual activity in the field of connecting jumpers. By failing to include the costs of these activities for the non-dedicated lines that the HAI model includes, the Joint Intervenors effectively would have Qwest perform the activities necessary to connect the unbundled loops they purchase without compensating Qwest for that work. *Id* at 48-49.

4. When the NRCM does Recognize Nonrecurring Costs, it Understates Them and Often Improperly Assumes that They will be Recovered Through Recurring Rates.

When the NRCM does recognize nonrecurring costs, it uses assumptions that are designed to understate the costs. For example, for "POTS/ISDN BRI – Install UNE Loop," the NRCM calculates some costs for the activities related to installing cross connects on the main distribution frame. However, these activities only occur when there is a straight copper loop, and the model assumes that copper loops exist only 40 percent of the time. As the NRCM documentation states, this is a significant variable because of the additional work steps associated with copper plant. The remaining plant is assumed to be Integrated Digital Loop Carrier ("IDLC"), specifically GR303, which has software that enables mechanized customer connections, and assumes that none of these activities is required for IDLC. Ex. AT&T/WorldCom-7 (Weiss (5/16/01) Dir.) at 84. Ex. Qwest-18 (Million Reb.) at 51-52.

The problem with that assumption is that Qwest has not deployed 60 percent IDLC, and certainly has not deployed 60 percent GR303. *Id.* at 52. Indeed, Mr. Weiss could not identify any carrier that has a network in which 60 percent of the plant is IDLC. Tr. at 1571 (Weiss

Cross). Thus, in the real world, Qwest will have to perform cross connects for this product for a significant majority of the time, while NRCM assumes they will be needed only 40 percent of the time. Once again, Qwest will incur these real-world costs on behalf of the CLECs, but the NRCM would assume them away and leave Qwest without cost recovery. Ex. Qwest-18 (Million Reb.) at 52.

The NRCM assumes away other nonrecurring costs that the model recognizes by assuming without support that the costs will be recovered through recurring rates. As discussed above, as a general principle, nonrecurring costs should be recovered in the manner in which they are incurred, not through recurring charges. But, in addition, the Joint Intervenors have no evidence that the nonrecurring costs that they would fold into recurring charges are actually included in the recurring rates that the parties have proposed in this proceeding. Indeed, the recurring rates that Qwest has proposed specifically exclude all nonrecurring costs. *Id.* at 49. Thus, the exclusion of certain nonrecurring costs from the NRCM cost estimates leads to a gap between the costs Qwest recovers in its recurring rates and the activities it performs to accommodate CLEC orders and provisioning. Likewise, nowhere in their testimony do the Joint Intervenors explain or demonstrate how these costs are to be recovered through the recurring charges, other than vague references to the factors in the HAI model. *Id.* at 50.

VI. Loop Conditioning

The FCC has established than an ILEC can recover the cost of loop conditioning. In its First Report and Order, the FCC stated that the "requesting carrier would . . . bear the cost of compensating the incumbent LEC for [loop] conditioning."[29] The FCC re-affirmed its position in the Third Report and Order.[30]

Qwest seeks a charge of $652.83 for removing up to 25 load coils from a specified loop route and for removing bridge taps. *See* Ex. Qwest-18 (Million Reb.), Ex. TKM-01R, at 8. These rates were devised by having SMEs estimate the amount of time required to remove load coils and bridge taps on a forward-looking basis. The rate includes time for travelling to the location of the load coil or bridge tap and the time needed for work set up. Because the additional time required to remove the other 24 load coils from a binder pair is minimal once Qwest has incurred travel and set-up time, the cost of removal is the same for up to 25 load coils. Sprint's charge for removing 25 load coils is more than Qwest's charge for 25 at the same location. *See* Tr. at 1764-65 (Farrar Cross).

The CLECs criticize Qwest's charges by claiming that on loops shorter than 18 kilofeet, a forward-looking design would not include load coils or bridge taps. Thus, they argue, Qwest cannot recover for the cost of removing loop impediments, since those impediments should not exist under TELRIC. In addition, they claim that Qwest should presume the removal of 25 load coils at a time and thus divide the proposed cost by 25 and charge on a loop at a time basis. Finally, the CLECs argue that Qwest recovers these charges already in its maintenance factors.

Qwest agrees that a forward-looking loop design would not include the use of load coils for loops under 18 kilofeet, but the existing load coils serve valid purposes and, as noted above, the FCC has stated that ILECs can recover the cost of removing them.

---

[29] *First Report and Order* ¶ 382.

[30] *See* Third Report and Order and Fourth Further Notice of Proposed Rulemaking, *In the Matter of the Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, CC Docket No. 96-98, FCC 99-238 (rel. Nov. 5, 1999) ¶ 192 ("*UNE Remand Order*").

Qwest already offers CLECs the opportunity to realize the economies of scale of removing 25 load coils at a time. Unfortunately, if the CLEC does not ask to have all 25 removed, then Qwest would not recover for the removal of additional load coils if it charged a unit price based on volume. Qwest would remove load coils and incur costs, but then have to wait for recovery until another CLEC sought to purchase the clean loop. Qwest does not recover these costs in the maintenance factor, because any cost of removing load coils upon a CLECs request, is backed out of the maintenance factor calculations.

All parties seem to agree that lops over 18 kilofeet need load coils for analog service and thus approve of recovery of removal costs. The CLECs suggest that Qwest should again remove all 25 loops in a binder group at a time, but with these loops analog pairs need the load coils. Thus, Qwest has even better reasons to remove only those load coils where the CLEC has requested removal and ordered the loop for digital use.

The CLECs also suggest that Qwest has already removed the load coils from most of its loops under 18 kilofeet. Where Qwest has already removed the load coils as part of a program to offer digital service, there will be no extra charge to CLECs for loop conditioning. That program does not apply to all loops, however, and CLECs should pay for removal of load coils on a loop which Qwest has not selected for digital service. Indeed, Qwest does not condition loops on individual requests by its retail customers.

Despite the FCC's recognition of line conditioning as a recoverable cost, Mr. Hydock, on behalf of the Joint Intervenors, argues that an ILEC can recover the cost of line conditioning "only where permitted by state commission order." Ex. AT&T/WorldCom-14 (Hydock Dir.) at 22. However, as Mr. Hydock conceded during cross-examination, the relevant provisions of the FCC's Order do not contain the limiting language he seeks to apply. Tr. at 1690 (Hydock Cross).

Notably, the Joint Intervenors are the only party to propose that Qwest should not be able to recover the cost of loop conditioning. Both Randy G. Farrar, a witness for Sprint Communications, L.P., and William Dunkel, a witness for Commission Staff, agree that Qwest should be able to charge for line conditioning. Ex. Sprint-1 (Farrar Dir.) at 24; Ex. S-29 (Dunkel Dir.) at 52. Thus, three parties, Qwest, Sprint and Staff concur that recovery for line conditioning is appropriate.

VII. Collocation Costs and Rates

Qwest's collocation cost studies follow TELRIC principles to estimate accurately the costs of installing collocation sites.

A. The Framework for Qwest's Collocation Study

1. The Costing Principles

Qwest uses TELRIC costing principles in its collocation cost study. The best way to determine the forward-looking cost of building a collocation area is to examine Qwest's recent experience building sites and to extrapolate replacement costs from that experience. For recently constructed sites, it is highly likely that the cost of replacing them is very similar to the cost of building them. The scorched node assumption dictates that Qwest use the existing central offices, not some idealized office of the future.

Regardless, Qwest's current rate structure and the study used to calculate those rates assume average values for cable lengths, new ducting and cable racking. Thus, there would likely be very little difference between the results of this study and the results if an idealized central office were used. The CLECs offered no evidence that Qwest' use of previous collocation receipts and the averaging of the cost of those installations yielded higher costs than the use of an idealized central office of the future.

Because collocation costs are incurred for specific collocators, Qwest charges for them on a one-time, non-recurring basis. It prorates the costs among the average assumed number of collocators per office, six. Indeed, XO witness, Mr. Knowles, acknowledged that XO desires more sharing between Qwest and the collocators, not an increase in the average number of collocators. It would be inappropriate to charge for these costs on a recurring basis, because the life of occupancy for any collocator is impossible to estimate, and Qwest cannot establish any minimum lease duration. If a collocator vacates the space and another collocator moves in, Qwest allows for a credit to the departing collocator for facilities that are reused. Qwest also presumes that large amounts of the facilities for collocation are shared with Qwest and thus prorates these expenses between Qwest and the CLECs.

2. The Data for the Collocation Study

Qwest's collocation cost estimates are based on the results of a study of 41 actual cageless collocation jobs that Qwest performed. Ex. Qwest-8 (Fleming Reb.) at 69. To prepare this study, Qwest assembled all the receipts for labor and materials from various outside vendors and the cost data for the Qwest internal resources used to build these cageless collocation sites. All these receipts and contracts were made available to the parties in this case once Qwest obtained permission from the vendors to release them. The Commission should use these recent, real costs to estimate the future replacement costs of collocation, not some fantasy estimate provided by the CLECs.[31]

After excluding the collocation jobs with the highest and lowest costs, Qwest assembled averages of the cost of all the tasks needed to install collocation sites such as engineering, installing HVAC ducting and cable racking, and running power cables to the collocated equipment and adding BDFBs. Because these sites did not include cages, Qwest also used data from an analysis of prices charged by 13 different contractors for construction of cages to create average estimates for the cost of constructing cages. The material costs are based upon prices that Qwest's normal supply sources charge with no add-on charges, except for expedited shipment charges. Where appropriate, Qwest made additional adjustments to the cost data from the cageless jobs to include costs for caged jobs. *Id.* at 53. Collocation must be performed

[31] Indeed, XO offers collocation at its central offices but provided no data on its costs and refused to answer data requests on the subject.

quickly under various state rules and demand has tended to fluctuate. Thus, Qwest assumed that it would use outside vendors for a large portion of the collocation sites. The average over the last three years is 50-50 and, thus, the study assumes 50 percent vendor and 50 percent internally installed sites.

The Joint Intervenors contend that the 41 jobs Qwest used to create its model unreasonably inflate the costs Qwest incurs to provide collocation. Ex. AT&T/WorldCom-11 (Knowles Dir.) at 4. The primary basis for this conclusion is that none of the 41 jobs was undertaken in Arizona and, therefore, are not representative of Qwest's Arizona costs. *Id.* When questioned, Mr. Knowles admitted that he had done no cost study from which he could conclude that the 41 collocation jobs were not representative of the costs that Qwest incurs providing collocation in Arizona. Tr. at 1639 (Knowles Cross). Further, Mr. Knowles admitted that some components of a collocation job will be the same across Qwest's 14-state territory. Tr. at 1635 (Knowles Cross).

The Joint Intervenors also contend that Qwest's model is flawed because the 41 jobs were all cageless collocation jobs and, thus, do not support Qwest's cost estimates for entrance facilities or cage construction. Ex. AT&T/WorldCom-11 (Knowles Dir.) at 4. Mr. Knowles acknowledges, however, that he did not perform any study comparing the costs of caged versus cageless collocation. Tr. at 1642 (Knowles Cross). In any case, as discussed above, Qwest specifically adjusted the cost data relating to cageless jobs to account for the additional costs associated with caged collocation jobs.

B. Entrance Facilities

The Joint Intervenors also contend that Qwest's model is faulty because it assumes that entrance facility costs will be shared among only three collocating CLECs when an average of seven CLECs collocate in each Qwest central office where CLECs collocate in Arizona. Ex AT&T/WorldCom-11 (Knowles Dir.) at 6. Contrary to the Joint Intervenors' claim, Qwest's models were constructed using the assumption that there are on average three cageless and three caged collocations in every office. Ex. Qwest-8 (Fleming Reb.) at 75. Thus, Qwest's model assumes that there will be, on average, six collocators per office. Further, Mr. Knowles acknowledged that for entrance facilities, only the three caged collocators will use the facilities. Tr. at 1645 (Knowles Cross).

The Joint Intervenors contend further that Qwest's proposed charges for entrance facilities are inflated because Qwest included the cost of constructing a manhole outside the central office that is dedicated to the use of the CLECs. Ex. AT&T/WorldCom-11 (Knowles Dir.) at 7. They also argue that even if space in existing manholes is exhausted, Qwest should share the cost of constructing an additional manhole. *Id.* As Mr. Knowles acknowledged in the hearing, however, Qwest reduced the percent allocation of costs of a dedicated manhole from 60 percent to 10 percent. Tr. at 1651 (Knowles Cross).

Qwest initially decided that a separate utility hole dedicated to collocation was advisable due to concerns about security and congestion. Ex. Qwest-8 (Fleming Reb.) at 31. However, as Qwest's construction practices evolved, Qwest revised its policy so that, now, Qwest installs a separate manhole for collocation only when congestion in the network absolutely requires an additional facility. Ex. Qwest-8 (Fleming Reb.) at 32. Accordingly, Qwest revised its studies to reflect the need for a dedicated manhole only 10 percent of the time. *Id.* at 31. This change reduces the nonrecurring direct costs for the standard entrance facility from $934.46 to $474.60 and the nonrecurring costs for the Cross-Connection Entrance Facility from $1,256.74 to $555.77. *Id.* at 32.

The Joint Intervenors also claim that Qwest's costs for fiber are not justified because Qwest fails to explain why it charges for additional facilities when it provides the fiber but not when the CLEC provides the fiber. Ex. AT&T/WorldCom-11 (Knowles Dir.) at 7-8. Yet, Mr. Knowles testified that additional facilities such as a fiber distribution panel are necessary in connection with standard and cross-connection entrance facilities. Tr. at 1653 (Knowles Cross).

Further, Mr. Knowles acknowledged that to the extent the facilities have now been shown to be necessary, he no longer has a problem with including the costs for them. *Id.*

C. Both the CLECs and Staff Improperly Suggest Major Revisions To the Studies Based On Alleged Minor Errors

Both the CLECs and Staff improperly seek substantial reductions in collocation charges based on alleged inaccuracies relating to only a few inputs. Staff uses the alleged improper mix of vendor/internal personnel and pricing for one or two of the materials needed for collocation in an attempt to justify a 60 percent reduction in pricing. Mr. Dunkel claims that because the vendor labor rate is substantially higher than Qwest's internal labor rate, Qwest should reduce all its labor charges to the internal rate. He also claims that because the cost of an 89-termination block is $44 in the original DSL study, Qwest should reduce the cost of termination blocks from $89 to $44 in the collocation study. He then extrapolates these two reductions, combined with an overhead adjustment, to recommend a total reduction in collocation prices of more than 60 percent.

The CLECs similarly rely on alleged power, engineering and block overcharges to recommend a 50 percent reduction in all collocation prices. However, as with Staff, the CLECs did not analyze the individual cost components in the study to determine if their sweeping proposal of a 50 percent reduction should apply to each element. Instead, Staff and the CLECs analyzed only a few components and improperly concluded that the cost reductions for those components should apply to all cost components in the study. As Mr. Fleming demonstrates, even if there were merit to Staff's and the CLEC's cost reduction for individual components – which there is not – those reductions would reduce Qwest's collocation prices by much less than 50 or 60 percent. *See, e.g.*, Ex. Qwest-8 (Fleming Reb.) at 63. On average, Qwest's rates would be reduced by only about 10 to 15 percent. *Id.*

D. Qwest Engineering Fees, Quote Preparation Fees, and Termination Costs Are Reasonable.

Staff and the CLECs also incorrectly claim that Qwest inflated its engineering charges. These charges come from estimates by experienced SMEs who have been or are involved in performing numerous collocation and similar central office jobs. These estimates are found in the study in a section attached to Mr. Fleming's testimony as Ex. 6. Other than unsupported speculation offered by Mr. Lathrop, these SME estimates provide the only specific evidence for the proper amount of engineering charges.

Mr. Knowles testified that Qwest's engineering costs included within the space construction charge are unreasonably high and should not exceed $2,000.00. Ex. AT&T/WorldCom-11 (Knowles Dir.) at 12. Further, Mr. Knowles claims that Qwest failed to present "any evidence of the nature of these costs or how they were incurred." *Id.* Contrary to Mr. Knowles' claim, the engineering costs were derived from actual costs included in Qwest's collocation model. Ex. Qwest-8 (Fleming Reb.) at 69.

Mr. Knowles also testified that Qwest's engineering costs are higher then those proposed by Verizon in the Washington cost docket. Ex. AT&T/WorldCom-11 (Knowles Dir.) at 12. However, it is risky and inexact to rely on a collocation study that another company prepared. The collocation charges that one company supports may not include collocation activities and services that another company performs. Ex. Qwest-8 (Fleming Reb.) at 70. Further, other companies may include engineering costs in the costs for specific structures. *Id.*

In its Second Report and Order on Collocation, the FCC recognized that it was difficult, due to structural differences, to compare collocation models across ILECs. *Id.* Given the disparities between models, any comparison must take into consideration the total design of the model to ensure all costs are appropriately recovered. Mr. Knowles failed to perform any such analysis. *Id.* at 71.

Mr. Lathrop expressed concern that Qwest was seeking to recover duplicative engineering costs for tasks that are included in the space construction charge and the quote preparation fee. Ex. WorldCom-13 (Lathrop Dir.) at 45. There is, in fact, an overlap between these charges for engineering costs. However, the overlap does not result in double recovery of these costs, since Qwest developed the quote preparation fee under the assumption that the fee would be credited against the space construction charge once the CLEC accepted the terms of the collocation. Ex. Qwest-8 (Fleming Reb.) at 36.

Mr. Knowles also asserts that Qwest provides no explanation for how it calculated the QPF. His claim, however, is unfounded. As Mr. Fleming testified, Qwest's calculation of the QPF charge was specifically laid out in the ENRCM. Qwest developed the QPF based on the time estimates of Qwest personnel involved in the processing of the quotes. Specifically, each task was identified and assigned time requirements. Current labor rates were then applied to the estimated times to derive the estimated costs for performing each function.

Initially, Mr. Knowles expressed concern that Qwest's QPF would amount to double recovery of certain preliminary engineering charges. As Mr. Knowles later acknowledged, the QPF will not result in double recovery of costs because the fee will be credited against the space construction charge once the CLEC proceeds with the collocation job. Tr. at 1233 (Knowles Cross); Ex. Qwest-8 (Fleming Reb.) at 36.

Mr. Knowles also testified that because Verizon does not charge a QPF, neither should Qwest. Ex. AT&T/WorldCom-11 (Knowles Dir.) at 13. Verizon's alleged product structure is not an appropriate benchmark by which to measure whether Qwest's fee is reasonable. Qwest's QPF is intended to recover the costs of preparing a bid for collocation work that is requested and then subsequently cancelled by the CLEC. Ex. Qwest-7 (Kennedy Reb.) at 7. The evidence demonstrates that there have been 659 collocation cancellations across Qwest's region since June 1999, of which 73 occurred in Arizona. *Id.* Therefore, the QPF is necessary to allow Qwest to be compensated for its costs when a CLEC collocation request is cancelled.

Mr. Lathrop also criticizes Qwest's time estimates for personnel involved in the processing of quotes. Ex. WorldCom-13 (Lathrop Dir.) at 43. Despite the fact that Qwest's estimates were provided by engineers involved in the actual collocation process, Mr. Lathrop proposed a different set of time estimates. *Id.*; Ex. Qwest-8 (Fleming Reb.) at 69. Because Qwest's estimates are provided by engineers who actually do the work, the Commission should rely on those estimates not Mr. Lathrop's unsupported estimates. *See* Ex. Qwest-8 (Fleming Reb.) at 69.

Finally, with respect to termination costs, Mr. Lathrop testified that Qwest overstates the cost of DSO blocks. Mr. Lathrop's conclusion is based on a comparison between Qwest's costs and the price list of two suppliers. Ex. WorldCom-13 (Lathrop Dir.) at 59. As Mr. Fleming testified, actual expenditures are a better gauge of costs than standardized price lists. Ex. Qwest-8 (Fleming Reb.) at 82.

E. Qwest's use of a Mix of Internal and External Labor Balances Efficiency with the Need for Timely Installation of Collocation Jobs

Staff and the CLECs claim that Qwest should have assumed that all but a small percentage of collocation jobs are performed by Qwest internal labor instead of vendor labor. As mentioned earlier, Qwest's study uses a 50/50 split between internal and vendor labor. This criticism ignores that collocation occurs in spurts and that Qwest would have to build up a staff that could well sit idle a substantial portion of the time. Since the passage of the Act, collocation requests have varied significantly from year to year. Given these changes in demand, Qwest chose to use outside vendors for many of its jobs instead of incurring the potentially higher costs of carrying employees who would not be utilized at full capacity. The labor split that Staff and the CLECs advocate could lead to either delays in completing jobs or overall increases in costs. Ex. Qwest-8 (Fleming Reb.) at 33-35.

F. The Material Costs and Power Charges in Qwest's Collocation Study are Reasonable

Staff and the CLECs claim that material costs in the collocation study are inflated because the materials are supplied by vendors that include mark-ups. They base this contention on a comparison of the price for termination blocks in the collocation study with the price for the same blocks in an outdated DSL study involving Qwest's own DSL service. However, as the supporting documents indicate, there are no vendor-purchased materials with tacked on charges included in the collocation study, except to expedite delivery where necessary or to acquire materials then in short supply. Some service vendors also sell materials, but at the same cost charged to Qwest and others for pure material purchases. The cost of termination blocks in the 1995 DSL study, $44, has been updated recently to show the increase in block prices to $85 brought on by the enormous demand for collocation. Thus, contrary to the Staff's and CLEC's contentions, Qwest uses the same price for blocks in the collocation study that it uses in the DSL study. Ex. Qwest-8 (Fleming Reb.) at 54-56.

The CLECs also claim that Qwest charges too much for installing power cables and for recurring power. The cable prices and the costs of installation come from the Qwest study of 41 actual jobs. These figures should carry more weight than GTE proposals from Washington state which have not been shown to be the same types of cables used and installed by Qwest.

The CLECs also assert that there is double-counting of BDFB costs for requests for power above 60 amps, which run directly to the power board. Qwest has addressed this concern by averaging the cost of a BDFB into all jobs based on the percentage of those requesting more than 60 amps of power.

Sprint is confused about the difference between fused amps and load amps. *See* Sprint Motion to Strike Testimony of Gary Fleming. Qwest bills for load amps which can be more than the amount actually used, but corresponds to the amount ordered. Fused amps reflects the maximum capacity of the cabling, which usually exceeds the load amps by 50 percent. Qwest does not bill for fused amps or redundant feeds. The present Sprint bills may not reflect the new collocation rate structure, but Sprint can opt into the new system if it is approved by the Commission.

The Joint Intervenors also contend that the lengths of power cables actually installed do not reflect the assumptions used in Qwest's model. AT&T/WorldCom-11 (Knowles Dir.) at 11. The evidence, however, demonstrates that Qwest's model assumptions are reflective of actual power cable lengths for Arizona collocation jobs. Ex. Qwest-8 (Fleming Reb.) at 79. Further, Mr. Knowles admitted that he had not conducted any study to determine whether Qwest's costs for power cable installation are different in Arizona than they are in the central offices included in the cost model. Tr. at 1658 (Knowles Cross).

Mr. Lathrop testified that Qwest's cost for power cable should be replaced by an average of similar cable costs from the RS Means and Cobra Cable and Wire manuals, which reference costs that are several percent to fifteen percent lower than the costs for these same cables in the Qwest model. Ex. WorldCom-13 (Lathrop Dir.) at 58. The power cable costs used in the Qwest study were taken directly from the actual receipts for the 41 jobs Qwest studied in creating its model. Ex. Qwest-8 (Fleming Reb.) at 78. As Mr. Fleming testified, the actual verifiable costs of the cables used in constructing a particular facility is a better gauge of Qwest's costs than the prices listed in a manual. *Id.*

G. Qwest Should Recover One-Time Collocation Costs As Non-Recurring Charges

The CLECs claim that Qwest should charge for HVAC, cable racking and some types of power only on a recurring basis, because these elements are reusable by Qwest if abandoned by the CLEC. Large portions of these charges are recurring – about 44 percent – and reflect the installation of HVAC, power plant and battery farms to provide DC power. The NRCs correspond to the cost of extending ducting to the collocation area and installing BDFBs and power cables to the collocation area. These facilities cannot be reused unless there are replacement collocators. If there are replacement collocators, Qwest refunds the money to the original collocator.

Mr. Lathrop testified incorrectly that Qwest developed recurring charges based only on whether collocation equipment is shared immediately with Qwest. Ex. WorldCom-13 (Lathrop Dir.) at 38. To the contrary, Qwest determined that a charge should be nonrecurring based on three criteria: (1) the facilities must have been constructed solely for the use of collocators; (2) the cost of the facilities must have been incurred at the time the collocation arrangement was established; and (3) the facilities were not required for the provision of any Qwest's services. Ex. Qwest-8 (Fleming Reb.) at 40. Under Mr. Lathrop's criteria, virtually all of Qwest's costs would have qualified for nonrecurring treatment. *Id.* at 41. In reality, many of the costs Qwest incurred in constructing collocation facilities for the CLECs did not qualify for nonrecurring treatment under Qwest's standards. *Id.* at 40-41.

Mr. Lathrop contends that another collocator can reuse many of the facilities Qwest constructs for a particular collocator if they are abandoned and, therefore, a recurring charge is necessary to prevent double recovery by Qwest. Ex. WorldCom-13 (Lathrop Dir.) at 39. Although equipment shared between collocators and Qwest can generally be reused, there are collocation facilities that Qwest builds for the exclusive use of one or more collocators that will most likely not be reused. Ex. Qwest-8 (Fleming Reb.) at 42. For example, Qwest will not reuse cages constructed for collocators. Similarly, Qwest has no alternative use for the DC power cables supplying the equipment located in a CLEC's collocation space, since these cables often terminate in an area where none of Qwest's equipment is located. *Id.* at 43. Qwest has reasonably proposed that only the cost of those facilities dedicated to the use of collocators be recovered through nonrecurring charges. *Id.*

Additionally, some collocation equipment that is not reused by Qwest may be reused by another CLEC. The first CLEC can recover some or all of its charges by transferring the equipment to another CLEC. Ex. Qwest-8 (Fleming Reb.) at 43. Mr. Lathrop's testimony is flawed because he assumes, without any support, that collocation equipment abandoned by one CLEC will be used by another CLEC with the same requirements. There is no evidence that the collocation will be reused, and even if reused, the collocation space may need significant alteration before a new CLEC would assume the space. *Id.* at 44.

Further, contrary to Mr. Lathrop's claim, the evidence demonstrates that in Arizona abandoned collocation installations are not being reused. Since June 1999, there have been 73 collocation cancellations in Arizona, of which only 11 have been assumed by a subsequent collocator. Ex. Qwest-7 (Kennedy Reb.) at 18. Consequently, without Qwest's collocation cancellation policy, Qwest could be left without recovery of the costs associated with the quote preparation fee and completed element installation charges in the 73 cancellations. *Id.* Additionally, the fact that the Change of Responsibility option has only been used 11 times in the past 24 months suggests that CLECs that start business in a previously served location may not be able to reuse the collocation equipment or are electing to use other means by which to provide service to their customers. *Id.* at 19.

Mr. Lathrop's concern about the reuse of equipment is based on his belief that a nonrecurring charge will allow Qwest to double recover when subsequent collocators occupy the same facilities. Ex. WorldCom-13 (Lathrop Dir.) at 40. Contrary to Mr. Lathrop's testimony, Qwest has served written policies that ensure that there will be no multiple recovery of the costs of erecting the facilities. Ex. Qwest-8 (Fleming Reb.) at 47.

Qwest's Collocation Change of Responsibility Policy provides that the vacating and new co-providers can negotiate terms and conditions regarding the transfer of the collocation facilities. Ex. Qwest-7 (Kennedy Reb.) at 17. Thus, when a new collocator assumes the facilities constructed for a previous collocator, the two collocators can work out a financial arrangement that compensates the original collocator for some or all of the cost it incurred to originally establish the collocation. Ex. Qwest-8 (Fleming Reb.) at 47. Qwest's Collocation Cancellation and Collocation Decommissioning policies also define terms under which a new collocator or Qwest will reimburse a vacated collocator for the reuse of the facilities. *Id.* at 47-48. The policies establish clearly that the CLEC assuming responsibility for a vacating CLEC's collocation site may do so only upon acceptance of the associate payment obligations owed the vacating CLEC. Ex. Qwest-7 (Kennedy Reb.) at 19. Therefore, the first provider to use the facility will not bear the entire cost of the one-time activity. *Id.*

H. Staff Applied Improper Loadings To The Direct Collocation Costs

Staff reduces the collocation charges by adding only 15 percent instead of including the shared and common costs in the loadings applied to collocation direct costs. Staff relies on the previous cost docket to justify the 15 percent. That decision applied only to true overhead in the 6700 account not the shared and common costs assigned to collocation. As explained by Mr. Fleming and Gude, all the evidence presented to support the 15 percent referred to the 6700 account and certain pure overhead loadings used in a short run marginal analysis applied by PacBell to set the minimum charge for Centrex services. Neither the AT&T analysis of the 6700 accounts or the ACSI study based on Centrex attempted to directly assign the shared and common cost as required by TELRIC. Thus, the Commission's selection of 15 percent meant to refer only to overhead costs such as planning, executives and finance. the commission reference to shared and common in its previous decision was an error.

I. Other Issues Relating to Collocation

Terminations

Without any evidence, the Joint Intervenors allege that Qwest's collocation terminations are significantly higher than the rate Verizon proposed in Washington. Ex. AT&T/WorldCom-11 (Knowles Dir.) at 14. The Joint Intervenors have not produced any evidence as to cost data concerning the complete structure of Verizon's rates for recovering termination costs outside Arizona. Without adequate information upon which to base a comparison, Qwest cannot respond to this claim, and the Commission should not rely on the comparison.

The Joint Intervenors also contend that Qwest failed to provide any support as to how its proposed termination costs were developed. *Id.* Contrary to this claim, Qwest provided more than sufficient evidence to support its proposed costs. Qwest based the calculation of the cost of terminations on its study of 41 actual collocation jobs. Ex. Qwest-8 (Fleming Reb.) at 81. Qwest provided the parties with the actual material receipts for the 41 jobs, as well as the worksheet used to develop the average cost for the item. *Id.* As the evidence shows, placement costs were derived by applying a weighting of internal labor rates and external contractor prices to the actual average number of specific materials placed in building the 41 collocations. *Id.*

CLEC to CLEC Connections

Mr. Knowles testified that the Joint Intervenors could not find any cost study or other support for the rates Qwest proposed for the various elements associated with CLEC-to-CLEC connections. Ex. AT&T/WorldCom-11 (Knowles Dir.) at 15. Contrary to his testimony, Qwest analyzed these costs in a separate stand-alone cost study which was provided as Exhibit TKM-15. Ex. Qwest-18 (Million Reb.) at 13.

Mr. Knowles' also asserts incorrectly that Qwest's CLEC-to-CLEC charge includes costs associated with installing cable racking even where Qwest uses existing cable racking. Ex. AT&T/WorldCom-11 (Knowles Dir.) at 16. Qwest's cost study for CLEC-to-CLEC connections assumes that a CLEC will utilize existing cable racking 95 percent of the time and that the remaining 5 percent of the time connections will require installation of an additional 20 feet of new cable racking. Ex. Qwest-18 (Million Reb.) at 14.

VIII. Line Sharing Costs and Rates

A. The Commission Should Establish a Price of $5.00 for the High Frequency Portion of the Loop.

1. Applicable Law Requires a Positive Price for the High Frequency Loop.

As the Commission considers the parties' competing economic and pricing testimony relating to the high frequency loop, it should not lose sight of the fundamental underpinning of this case: the CLECs are demanding that Qwest turn over a highly valuable asset to its competitors for free. There is no dispute that the high frequency loop is a valuable piece of Qwest property and that by surrendering this network element to its competitors, Qwest is losing a valuable asset, providing substantial value to the CLECs, and enhancing the ability of CLECs to compete with Qwest in providing high speed data services.

Not surprisingly, the law recognizes that a company cannot be required to turn over a valuable asset to competitors without just compensation. Thus, the Act requires "just and reasonable" rates for UNEs, and the FCC requires prices that mirrors prices in a competitive market. These provisions of law require the Commission to reject the CLECs' demand that they receive the high frequency loop for free and, instead, to assign a positive price that compensates Qwest for the forced surrender of its property.

As Congress was aware when it passed the Act, the prohibition against unlawful takings set forth in the Fifth Amendment to the United States Constitution requires that ILECs be fairly compensated for the compelled surrender of their property to competitors. Accordingly, section 252(d)(1) of the Act *requires* state commissions to establish rates for interconnection and unbundled network elements that are "just and reasonable."

The FCC has directly addressed the meaning of "just" compensation as that term applies to establishing rates for UNEs. According to the FCC, "[j]ust compensation is normally measured by the *fair market value* of the property subject to the taking."[32] The CLECs' advocacy of a price of zero for the high frequency loop can be adopted only if the Commission concludes that it is just and reasonable for Qwest to receive nothing in return for surrendering a valuable piece of its network to its competitors. As the FCC's own definition of "just" compensation makes clear, there is no reasonable interpretation of Congress' use of "just and reasonable" that supports requiring Qwest to give away a valuable asset for free.

A fundamental underpinning of the FCC's pricing rules is that prices should replicate conditions in a competitive market. Thus, the FCC has emphasized that the TELRIC standard "attempts to replicate, with respect to the bottleneck monopoly elements, *the rates that would be charged in a competitive environment*."[33] The FCC explained its rationale for basing rates on conditions in a competitive market:

> Adopting a pricing methodology based on forward-looking, economic cost best replicates, to the extent possible, the conditions of a competitive market . . . . Because a pricing methodology based on forward-looking costs simulates the conditions in a competitive marketplace, it allows the requesting carrier to produce efficiently and to compete effectively, which should drive retail prices to their competitive levels.[34]

In a competitive market, there would be a positive price for the high frequency loop. This conclusion is unavoidable, since the norm in a competitive market is that a product in limited supply that has a positive demand also has a positive price. Ex. Qwest-28 (Fitzsimmons Dir.) at 15. As Dr. Fitzsimmons explains, the expectation of a positive price for a product is even more pronounced when selling the product precludes the seller's use of it. Ex. Qwest-28 (Fitzsimmons Dir.) at 15-16. Here, when Qwest leases the high frequency loop to a competitor, it can no

---

[32] *First Report and Order* ¶ 740 (emphasis added).

[33] *Id.* ¶ 740.

[34] *Id.* ¶ 679.

longer provide xDSL service over that portion of the loop. In a competitive market, there is no likelihood that a rational provider would surrender its ability to use the high frequency spectrum on its loops without requiring compensation from the competitor that will use the spectrum. Stated another way, in a competitive market, the CLECs could not realistically expect to receive a valuable asset from a competitor for free. Ex. Qwest-28 (Fitzsimmons Dir.) at 15-16.

Accordingly, the CLECs' demand that the high frequency loop be priced at zero directly contradicts the FCC's directives that UNEs should be priced in a manner that replicates rates in a competitive market. Those directives from the FCC require a positive price for the high frequency loop.

2. The price of $5.00 for the high frequency portion of the loop is just and reasonable and consistent with the FCC's pricing principles.

The Act's requirement of just and reasonable rates for UNEs and the FCC's pricing rules support a rate of $5.00 for the high frequency loop. First, all the costs associated with the unbundled loop are rendered common costs because of the presence of dedicated connections from a single customer to two different providers. The FCC's pricing rules require a "reasonable allocation" of common costs. Here, allocating the common costs between the two dedicated connections on the loop is reasonable and is consistent with the Act's requirement of just and reasonable rates.

Second, both the Act and the FCC's pricing rules are designed to foster fair and equal competition among providers and to foster technological innovation through investment in telecommunications facilities. Establishing a positive price for the high frequency loop in the manner Qwest recommends will promote these goals. By contrast, a price of zero for this UNE will distort competition and discourage investment in alternative methods of providing high-speed data services.

The addition of line sharing to the unbundled loop renders all of the costs associated with the loop joint and common. Ex. Qwest-28 (Fitzsimmons Dir.) at 9-10. As Dr. Fitzsimmons explains, before there was line sharing, there was only one dedicated customer connection, and it caused all the costs of the loops. Ex. Qwest-28 (Fitzsimmons Dir.) at 9-10. Line sharing resulted in a second dedicated connection, leaving the costs of the loop common to both connections. Ex. Qwest-28 (Fitzsimmons Dir.) at 9-10. In other words, there are now two connections or uses associated with the unbundled loop.

Accordingly, in establishing a price for the high frequency loop, the issue is what constitutes a reasonable *share* of joint or common costs. The FCC is clear about the requirement to allocate common costs in establishing prices for UNEs and interconnection:

> Certain common costs are incurred in the provision of network elements . . . [S]ome of these common costs are common to only a subset of the elements or services provided by incumbent LECs. Such costs shall be allocated to that subset, and should then be allocated among the individual subset, to the greatest possible extent . . . *Because forward-looking common costs are consistent with our forward –looking, economic cost paradigm, a reasonable measure of such costs shall be included in the prices for interconnection and access to network elements.*[35]

This Commission previously recognized the obligation to allocate common costs in the generic cost docket by including costs of this type in the rates it established for UNEs. In the Line Sharing Order, the FCC directed state commissions to establish the price for the high frequency loop "in the same manner as they set the price for other unbundled network elements."[36] Consistent with that directive, the Commission is required to perform a reasonable allocation of common costs in establishing the price for the high frequency loop.

---

[35] *Id.* ¶ 694 (emphasis added); *see also* 47 C.F.R. § 51.505(c) (requiring "reasonable allocation" of forward-looking common costs)..

[36] Third Report and Order in CC Docket No. 98-147, Fourth Report and Order in CC Docket No. 96-98, *In the Matter of the Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, CC Docket Nos. 96-98 & 98-147, FCC 99-355 (rel. Dec. 9, 1999) ¶ 135 (*"Line Sharing Order"*).

There is no fixed formula for determining what constitutes a reasonable allocation of these costs. As Dr. Fitzsimmons stated, there is no "correct" allocation of common costs; instead, the allocation of these costs must pass a test of reasonableness measured against the goals of the Act and the objectives of the FCC's pricing rules. Ex. Qwest-28 (Fitzsimmons Dir.) at 11-12.

As a starting point, it should be clear that not allocating *any* costs to the high frequency loop and establishing a price of zero is not reasonable. That result would violate the pricing parameters discussed earlier – the Act's requirement of "just and reasonable" rates and the FCC's directive that prices should replicate conditions in a competitive market. Equally important, requiring Qwest to give away a valuable asset to competitors for free – the consequence of assigning no common costs to the high frequency loop – offends any common sense notion of what is "reasonable."

Far more supportable than a price of zero is a rate that reflects the FCC's clear intent to establish UNE prices that are consistent with the result in a competitive market.[37] As Dr. Fitzsimmons explains, a rate based on an allocation of common costs between the two dedicated uses of the loop is most consistent with the transition to a competitive market. Ex. Qwest-28 (Fitzsimmons Dir.) at 11-12. This allocation will preserve incentives for efficient investment, maintain pricing symmetry, and promote competitive neutrality. Ex. Qwest-28 (Fitzsimmons Dir) at 13-15.

As stated by Congress, the fundamental purposes of the 1996 Act included promoting competition and encouraging "the rapid deployment of new telecommunications technologies."[38] These dual purposes are served by an allocation of common costs that results in a positive price

---

[37] *See First Report and Order* ¶¶ 679, 740.

[38] Telecommunications Act of 1996, Pub. L. No. 104-104, purpose statement, 110 Stat. 56, 56 (1996).

for the high frequency loop; they are not served by requiring Qwest to give away this asset for free.

The FCC has emphasized that the 1996 Act "is intended to pave the way for enhanced competition in *all* telecommunication markets, by allowing all providers to enter all markets."[39] Consistent with this objective, the Act must be implemented in a manner that does not favor some providers over others. The FCC stressed this point in its pricing rules. "The commissions will determine whether the 1996 Act is implemented in a manner that is *pro-competition* and favors one party . . . or, as we believe Congress intended, *pro-competition*."[40] And the Act itself requires prices that are "nondiscriminatory," a mandate that is designed to ensure that some providers are not favored over others.[41]

DSL providers face competition from providers that are using cable modems, wireless technology, and satellite-based technology to provide high speed data services. Ex. Qwest-28 (Fitzsimmons Dir.) at 17-18. Establishing a price of zero for the high frequency loop plainly would give a competitive advantage to DSL providers over these other types of providers who must pay for the facilities they use to provide high speed data services. For example, satellite providers are required to pay competitive prices for frequencies they acquire through public auctions and use to provide their services. Ex. Qwest-28 (Fitzsimmons Dir.) at 17, fn 13. Similarly, cable modem providers must make substantial investments in their network to be able to provide competitive, high speed data services. If DSL providers are allowed to obtain for free the network that is most critical to the services they provide, they will have a clear pricing advantage over these other types of providers. Ironically, a price of zero for the high frequency

39 *First Report and Order* ¶ 4 (emphasis in original).

40 *Id.* ¶ 618.

41 *See* 47 U.S.C. § 252(d)(1)(A)(ii).

loop will give DSL providers the ability to engage in precisely the type of price squeezing against their competitors that the FCC feared the incumbent LECs could impose against the DSL providers. The playing field simply will not be level for attentive providers of data services who must pay full, competitive prices for their facilities.

The corollary to this anti-competitive result is that investment in new technologies and facilities will be stifled. Alternative providers of high-speed data services will have less incentive to invest if they are competing against DSL providers that do not pay for their essential facility. Ex. Qwest-28 (Fitzsimmons Dir.) at 17-19 and 21. Further, the DSL providers themselves will have significantly reduced incentive to build their own facilities and to invest in alternative technologies if they do not have to pay for the high frequency loop. This effect will be most acute for residential and small business customers, since CLECs already are investing very little in loop facilities to serve these customers.

Accordingly, the Act's fundamental purposes -- promoting equal and fair competition and fostering rapid, efficient technological change -- support an allocation of the common costs associated with the unbundled loop that produces a positive price for the high frequency loop. While it is true that there is no precisely "correct" way of allocating these costs. An allocation can be "reasonable" only if it accounts for this critical policy considerations.

3. The CLECs' assertions of the potential for a double-recovery and a possible price squeeze are unfounded.

A fundamental argument of the CLECs in support of receiving the high frequency loop for free is that Qwest already recovers the full cost of the loop through its retail prices, and that any additional revenue from the loop will lead to a double-recovery. Qwest will address this contention in full in its reply brief, but a short response is required here. The CLECs' argument is flawed for at least two fundamental reasons.

First, there is no evidence at all that Qwest already is recovering the cost of the loop through its retail prices. In fact, because retail rates were set without regard to the economic costs of the loop, the CLECs' assertion that retail rates recover the cost of the loop is sheer speculation.

Second, the CLECs' focus on Qwest's retail prices for determining the price of a UNE is improper. Congress and the FCC have established that prices for UNEs must be cost-based, and that is the principle that this Commission and state commissions throughout the country have followed in establishing UNE rates. Nowhere in its pricing rules does the FCC indicate that retail prices should be considered in establishing cost-based rates for UNEs. Instead, cost-based pricing requires an estimation of the incremental costs that are caused by providing a UNE, along with a reasonable allocation of common costs. Prices for services are not relevant to determining the *cost* of a UNE and, hence, are not relevant to determining the *price* of a UNE. Ex. Qwest-28 (Fitzsimmons Dir.) at 6; Ex. Qwest-29 (Fitzsimmons Reb.) at 66-71. Z-Tel's witness, Dr. Ford, who testified that retail service offerings are irrelevant to the proper treatment of line sharing and loop charges, recognizes this fundamental principle. Ex. Z-Tel-2 (Ford Surreb. and Sum.) at 10.

The CLECs also assert that if the price for the high frequency loop is anything other than zero, Qwest will have the ability to engage in an anti-competitive price squeeze. This assertion also is unfounded. In its *Line Sharing Order*, the FCC stated that state commissions "may require that incumbent LECs charge no more to competitive LECs for access to shared loops than the amount of loop costs the incumbent LEC allocated to ADSL services when it established its interstate retail rates for those services."[42] This pricing "guidance" by the FCC suggests that state commissions could choose to price the high frequency loop based on the amount of loop cost the incumbent LEC "allocated," "attributed," or "imputed" in its interstate xDSL cost filing with the FCC. Since the FCC's rules relating to interstate cost filings require the filing of only direct costs – and a loop cost cannot be a direct cost of an xDSL service – it is logical to assume that the FCC's primary concern is with the *price* of xDSL service, not the *cost*. Ex. Qwest-16

---

[42] *Line Sharing Order* ¶ 139.

(Million Dir.) at 66-67. In other words, the FCC's objective is to ensure that ILECs do not price their xDSL services in a manner that results in a price squeeze for competitive DSL providers.

Here, Qwest's price of $29.95 for its retail DSL service ensures that there will not be a price squeeze. This price is at a level that exceeds the direct cost of the service, plus an imputation of the proposed line sharing UNE rate. Accordingly, the charge of $5.00 that Qwest proposes meets the FCC's guideline.

B. Nonrecurring Costs and Prices Associated with Line Sharing

Unlike the manner in which a voice call is routed for a CLEC that has collocated within a Qwest central office, line sharing introduces new, unique requirements upon all parties involved. New equipment, cross connects, systems, and other complexities are introduced into the network in order to route voice and data traffic separately. Ex. Qwest-23 (Overton Dir.) at 21.

In a line sharing arrangement, the loop comes in to the central office from an outside location and connects to the COSMIC frame or to an MDF. The loop then is cross-connected and routed to an IDF, which, in turn, is cross connected and then routed to a "POTS splitter." The POTS splitter splits the voice and data traffic into two distinct transmissions allowing the voice traffic to be routed to Qwest and the data traffic to the CLEC collocation area. *Id.* In designing the architecture for line sharing, the POTS splitter may be placed in any of the following locations within the central office: (1) in a common area; (2) on an IDF; (3) on an MDF; or (4) in the CLEC/DLEC's collocation area. *Id.* at 22. Each alternative has unique costs, requirements, and benefits.

All of the design options have unique costs associated with them. Additionally, when a CLEC/DLEC chooses the option of placing its splitter in its collocation area, there are charges that are not specific to line sharing, such as the use of one of its existing terminations for the return of the voice and re-stenciling of that termination. Ex. Qwest-10 (Brohl Dir.) at 7. The nonrecurring charges for line sharing include charges for reclassification, splitter shelves, splitter tie cable options (common area, IDF, MDF), engineering, and basic installation. *Id.* at 6. Other nonrecurring rates that may be applicable to line sharing include conditioning, additional testing and trouble isolation charges. *Id.* at 7.

Commission Staff and the Joint Intervenors assert incorrectly that the nonrecurring engineering charges that Qwest has proposed for line sharing are overstated. Ex. WorldCom-13 (Lathrop Dir.) at 47; Ex. S-29 (Dunkel Dir.) at 20. The Joint Intervenors argue that Qwest has overstated the amount of time that is needed to perform the engineering functions associated with splitter collocation, while Staff focuses on whether a field survey is necessary and, therefore, should be included within the engineering charge. *Id.*

Additionally, Staff's contention that a field survey is unnecessary is not supported by any creditable evidence. Mr. Dunkel testified that he had been told that a Qwest employee said that Qwest generally does not conduct a field survey. Ex. S-29 (Dunkel Dir.) at 21. Staff provided no evidence to demonstrate that Mr. Dunkel's hearsay testimony is reliable. The Qwest employee may not have been aware of field surveys performed by contractors of Qwest. Therefore, Qwest's evidence that a field survey is necessary should not be discounted based on hearsay speculation.

The Joint Intervenors also claim that an IDF is not technically necessary to complete a splitter connection for Qwest or for CLECs. Therefore, by including an IDF in some line sharing configurations, they argue, Qwest is increasing collocation costs unnecessarily by requiring additional cables, connecting blocks, cross connects, installation labor and the IDF itself. Ex. WorldCom-13 (Lathrop Dir.) at 60. This argument also is misplaced.

Qwest's evidence demonstrates that an IDF is necessary under certain configurations. Ex. Qwest-16 (Million Dir.) at 72. Furthermore, the Joint Intervenors ignore the fact locating the splitter on an IDF is merely one of three options available to the CLECs. *Id.* A CLEC may also choose a fourth option – to purchase and install the splitter in the CLECs' own collocation space, thereby avoiding Qwest's charges. Ex. Qwest-16 (Million Dir.) at 74.

The Joint Intervenors also argue that Qwest should not use actual cable lengths in estimating the nonrecurring costs associated with line sharing, but, instead should estimate the cable lengths that would be necessary in a newly-constructed central office. Ex. WorldCom-13 (Lathrop Dir.) at 60. Their proposed reliance on hypothetical costs associated with a newly-constructed central office is not appropriate. Not only is there no evidence as to those costs, there is no evidence that the costs would be any different then Qwest's actual costs. Therefore, the only basis for determining the cable lengths and associated costs is the costs derived from the actual collocation jobs studied by Qwest.

Staff contends that Qwest charges different rates to non-affiliated DSL providers than Qwest-affiliated DSL providers. Staff points to Qwest's per line nonrecurring charge for line sharing in an attempt to support this contention. According to Staff, Qwest charges non-affiliated DLS providers $80.00, while the Qwest-affiliated DSL provider "pays some other charge." Ex. S-29 (Dunkel Dir.) at 29. Staff further argues that an unaffiliated DSL provider pays numerous recurring and nonrecurring charges, while a Qwest-affiliated DSL provider pays one simple recurring rate per bay and one of two simple nonrecurring rates per bay. Ex. S-29 (Dunkel Dir.) at. 30.

Staff's assertion that Qwest charges non-affiliated DLS providers $80.00 while choosing to charge its affiliate another rate fails to acknowledge that the $80.00 charge is a negotiated rate that is assessed for the connections necessary to accommodate line sharing for CLECs. Ex. Qwest-18 (Million Reb.) at 60. Qwest's proposal for a permanent nonrecurring rate for the shared loop is $37.71 based, in part, on the flow-through assumptions incorporated in Qwest's nonrecurring study since the time the $80.00 charge was negotiated. *Id.*

Pursuant to the affiliate transactions rules Qwest cannot use this interim rate because it is neither a prevailing company rate nor a fair market value. As required by the rules, Qwest charges its affiliate a fully distributed cost for the same types of activities performed for it by Qwest personnel. *Id.* at 61.

Staff's concern that a Qwest-affiliated DSL provider pays one simple recurring rate per bay and one of two simple nonrecurring rates per bay ignores the facts that warrant the difference in pricing. Mr. Dunkel's testimony fails to point out that the reason why Qwest's affiliate does not pay for collocation of a splitter is because the affiliate uses a different architecture, a remote Universal System Access Multiplexer, to provide its services. Qwest charges its affiliate a fully distributed cost for the connections required for its affiliate to access Qwest's distribution plant at a remote location. *Id.* at 63. Additionally, Mr. Dunkel's testimony fails to mention that Qwest's affiliate pays Qwest 50 percent of the Commission-approved subloop rate to access the high frequency portion of the subloop. This rate is much higher than the $5 loop charge that Qwest proposes to charge the CLECs for line sharing over the entire loop. *Id.* at 63. Moreover, the CLECs have the option of purchasing and installing equipment remotely and then accessing Qwest's subloop in the same manner as Qwest's affiliate. *Id.*

Unlike the ICB charges that apply to CLECs, which are based on forward-looking TELRIC costs, Qwest charges its affiliate for time and materials on a fully loaded basis for all of the work Qwest performs. *Id.* at 61. Additionally, when the Commission sets permanent rates for line sharing, those rates will apply to Qwest's affiliates. *Id.* at 62.

IX. Line Splitting

Qwest agrees that it is required to provide line splitting to voice CLECs using the UNE-P. Ex. Qwest-11 (Brohl Supp. Dir.) at 16. The FCC has defined "line splitting" as the delivery of voice and data services provided by competitive carriers over a single loop.[43] For those CLECs that request it, Qwest will provide a line splitting service to allow CLECs to provide voice and

---

[43] Memorandum Opinion and Order, *In the Matter of the Application by SBC Communications, Inc., Southwestern Bell Telephone Company, and Southwestern Bell Communications, d/b/a Southwestern Bell Long Distance Pursuant to Section 271 of the Telecommunications Act of 1996 to Provide In-Region, InterLATA Services in Texas*, CC Docket No. 00-65, FCC 00-238 (rel. June 30, 2000) at ¶ 324 ("*SBC Texas 271 Order*").

data services over the same unbundled loop using Qwest's UNE-P for "plain old telephone service" ("UNE-P POTS").

As distinguished from line splitting, line sharing occurs where Qwest occupies the low frequency portion of the loop, which is used to provide voice-grade service, and a single CLEC occupies the unbundled high frequency portion, which is used to provide data service. Brohl Dir. at 5. Using the high frequency portion of an unbundled loop, a CLEC can provide xDSL service that is compatible with the UNE-P POTS service, *e.g.*, ADSL. *See* Ex. Qwest-23 (Overton Dir.) at 19 (explaining the technical limitations of a shared loop). By contrast, in a line splitting arrangement, two different CLECs occupy the high and low frequency portions of the loop, which is controlled by the voice CLEC. Ex. Qwest-11 (Brohl Supp. Dir.) at 5-6. A separate arrangement between the two CLECs governs the provisioning of service to the end user, and Qwest is not involved in that arrangement. Notwithstanding the distinction between the line splitting and line sharing, the architecture of each should be the same.

A. Architecture for Line Splitting (including ownership of the splitter)

As with line sharing, line splitting requires the use of a voice splitter. Ex. Qwest-11 (Brohl Supp. Dir.) at 5-6. A voice splitter is a device that separates the voice traffic from the data traffic over the same loop, allowing for simultaneous transmission of both forms of communication. Ex. Qwest-23 (Overton Dir.) at 21-22. Despite any arguments by the CLECs to the contrary, the CLECs purchasing the unbundled loop are responsible for providing their own splitter.[44] Although the FCC indicated in the Line Sharing Reconsideration Order that it intended to revisit the issue in an upcoming proceeding, its current position is that ILECs are not obligated to either own or maintain such splitters on behalf of CLECs requesting line splitting service. Qwest's position is consistent with this FCC pronouncement.

[44] *SBC Texas 271 Order* at ¶ 325; *Line Sharing Reconsideration Order* at ¶ 19.

In the SBC Texas 271 Order, the FCC explained its conclusion that ILECs are not required to provide the CLECs with splitters:

> The Commission has never exercised its legislative rulemaking authority under section 251(d)(2) to require incumbent LECs to provide access to the splitter, and incumbent LECs therefore have no current obligation to make the splitter available. . . . We did not identify any circumstances in which the splitter would be treated as part of the loop, as distinguished from being part of the packet switching element. That distinction is critical, because we declined to exercise our rulemaking authority under section 251(d)(2) to require incumbent LECs to provide access to the packet switching element . . . .
>
> The UNE Remand Order cannot fairly be read to impose on incumbent LECs an obligation to provide access to their splitters. . . . [45]

It is clear, therefore, that the splitter does not qualify as a UNE to which an ILEC is required to provide access.

A review of the unbundling standards set forth in section 251(d)(2) makes clear why a voice splitter does not qualify as a UNE to which an ILEC must provide access. A splitter is not a proprietary element and, therefore, does not have to pass the "necessary" prong of the "necessary and impair" standard in section 251(d)(2). Specifically, voice splitters are available on the open market at comparable prices to both ILECs and CLECs, who have been purchasing them to provide their respective types of xDSL service. The FCC has acknowledged this availability.[46] Both Qwest and the UNE-P CLECs can obtain voice splitters from third-party vendors in a competitively neutral manner and the voice splitter is simply a cost of doing business for an xDSL provider.

---

[45] *SBC Texas 271 Order* at ¶¶ 327, 328.

[46] *See UNE Remand Order* ¶ 308 ("equipment needed to provide advanced services . . . are available on the open market at comparable prices to incumbents and requesting carriers alike").

Access to a non-proprietary network element is appropriate only if lack of access will "impair" a requesting carrier.[47] A requesting carrier will be found to be impaired in offering a service only if it cannot self-provision the element or obtain it from a source other than the ILEC *and* if lack of access materially diminishes the carrier's ability to provide a service.[48] Here, the CLECs cannot meet this "impair" standard, since they clearly are able to self-provision or purchase splitters on the open market in the same manner as Qwest.

Finally, requiring Qwest to provide stand-alone voice splitters in a line splitting situation would harm Qwest by forcing it to purchase equipment it does not already use. Qwest currently employs an integrated voice splitter/DSLAM in its provision of a Rate Adaptive Digital Subscriber Line ("RADSL") service. Qwest would have to purchase stand-alone voice splitters solely to accommodate line-splitting CLECs. Given that the FCC has already determined that CLECs are on "relatively equal footing" as compared to ILECs with respect to acquiring and installing equipment necessary to provide advanced services, and that such pieces of equipment are not needed to provide access to all functionalities and capabilities of the loop, it would be inequitable to require Qwest to provide voice splitters.[49]

B. Line Splitting Costs

Qwest has not provided any new costs studies specific to line splitting, because the costs associated with line splitting are addressed with proposed or existing rates. Brohl Supp. Dir. at 7. Qwest's only recommendation is that the Commission refrain from ordering firm deadlines for deployment of line splitting, allowing instead for a collaborative process to first determine the operational impacts and then proceed with the issue of establishing a deployment schedule.

---

[47] *UNE Remand Order* at ¶ 31.

[48] *Id.* ¶ 51.

[49] *See id.* at n. 609; *SBC Texas 271 Order* ¶¶ 326-28.

X. Qwest's Recovery of the Costs Associated with Operation Support Systems

A. Legal Standard

Qwest is entitled to recover the costs it incurred in providing CLECs with access to OSS. This right is rooted in the cost recovery provisions of the Act set forth at section 252(d)(1). The FCC has defined OSS as a UNE. Therefore, section 252(d)(1), which entitles ILECs to recover the costs of providing access to UNEs, allows ILECs to recover the costs associated with providing OSS access. In addition, the FCC has stated unequivocally that "incumbent LECs should recover in their line sharing charges those reasonable incremental costs of OSS modification that are caused by the obligation to provide line sharing as an unbundled network element."[50]

B. Qwest's Costs

Qwest seeks recovery of $12, 826,720 in costs it incurred in modifying its OSS. Specifically, Qwest seeks recovery of $870,720.00 for modifications to Qwest's internal OSS, $56,000.00 for project management, and $11,900,000.00 for Telcordia's delivery of a long-term line sharing solution. The costs Qwest requests are solely attributable to line sharing and would not be necessary but for the modifications to Qwest's OSS that were necessary to support line sharing. Ex. Qwest-3 (Albersheim Dir.) at 24. This Commission should allow Qwest to recover these costs because Qwest was required to perform substantial work to modify its OSS, the modifications to Qwest's OSS are only for the use of the CLECs, and the objections raised by the CLECs are without merit.

---

[50] *Line Sharing Order* ¶ 144.

1. Qwest Was Required To Performed Substantial Work To Modify Its OSS to Provide Line Sharing.

To successfully modify its OSS, Qwest was required to engage in a series of developmental and implementation activities and utilize a standard development lifecycle process. First, Qwest was required to work closely with CLECs and develop the line sharing business requirements. The development of the line sharing business requirements was accomplished through weekly face-to-face meetings attended by representatives of Qwest and interested CLECs ("Joint Team"). At these meetings, the Joint Team developed high-level processes for line sharing and identified issues to be resolved in relation to those processes. The Joint Team considered five general categories of OSS issues: (1) pre-ordering; (2) ordering; (3) provisioning; (4) billing; and (5) repair and maintenance. Ex. Qwest-3 (Albersheim Dir.) at 12.

Second, once the Joint Team identified the line sharing business requirements, it analyzed how the line sharing business requirements impacted Qwest's OSS. As explained in Exhibit RA-2 to the direct testimony of Renee Albersheim, the Joint Team identified eight broad areas for modification of Qwest's OSS. The Joint Team also developed long-term system solutions and deployment timeframes (when known) for each of these eight broad areas. In situations where CLECs desired a more immediate solution, the Joint Team developed interim solutions and timeframes. The Joint Team also defined the provisioning process, the repair process, and the network architecture for line sharing. Qwest and the CLECs agreed that initial deployment would be based on a combination of automated and manual work steps, with full mechanization occurring with the delivery of the long-term solution. *Id.* at 13-14.

Third, Qwest prepared a statement of work describing in detail the OSS modifications necessary to support line sharing based on the Joint Team's analysis and recommendations. *Id.* at 14-15. Because line sharing is a complex UNE where one customer is serviced by one LEC for voice and another LEC for data, several significant modifications to Qwest's OSS were necessary including changing Qwest's OSS to accept, recognize, process, direct, transfer and store line sharing information. *Id.* at 17-22. Once completed, the statement of work was submitted to Telcordia for preparation of an implementation plan and cost quote. *Id.* at 15.

Fourth, Qwest implemented the in-house changes that the Joint Team identified. *Id.* Qwest, also worked with Telcordia in implementing the long term line sharing solution. The efforts by Qwest detailed above required a significant amount of resources and time and should be compensated. Accordingly, the costs that Qwest seeks to recover are appropriate and justified.

2. The Modifications To Qwest's OSS are Only for the Use of the CLECs.

Qwest's modifications to its OSS were essential to the CLECs' ability to use Qwest's OSS to perform line sharing functions. Qwest does not line share with itself. Ex. Qwest-3 (Albersheim Dir.) at 23-24. As the FCC stated, line sharing is "[t]he provision of xDSL service by a competitive LEC and voiceband service by an incumbent LEC on the same loop."[51] Therefore, line sharing only occurs when an ILEC and Co-Provider deliver voice and data to the same customer on the same loop. Qwest does not need these modifications to its OSS for its xDSL product. Qwest made the OSS changes solely for the use of CLECs to allow their xDSL product over the same line on which Qwest provides voice service. *Id.* at 24.

3. The CLECs Objections Are Without Merit.

The CLECs argued that the Commission should reject Qwest's request for costs because (1) CLECs should not be required to pay for database clean up, (2) there is no basis for Telcordia's charge, (3) the long-term line sharing solution provides the same services as the interim solution, and (4) Qwest could have developed a long-term line sharing solution at a lower cost by sharing the development costs with other ILECs. The CLECs' arguments are unpersuasive for the following reasons.

---

[51] *Id.* ¶ 4.

First, the costs that Qwest seeks to recover are not associated with database clean up. As Renee Albersheim testified:

> Qwest is well aware that it would be inappropriate to ask CLECs to pay the costs of OSS enhancements that are of benefit to Qwest in addition to the CLECs. Qwest has not and does not intend to seek recovery of such costs from CLECs. . . . By discussing "database cleanup" Mr. Lathrop implies that such costs were included in the OSS cost filings in this docket. They were not. The only costs Qwest included were those necessary to provide pre-ordering, ordering, provisioning, billing and maintenance OSS functions for line sharing.

Ex. Qwest-4 (Albersheim Reb.) at 2.

Second, Telcordia's charge is appropriate and justified. In response to a formal request from Qwest, Telcordia provided written confirmation that 85 percent of the software costs applied exclusively to line sharing. Qwest provided, as a confidential attachment to an AT&T data request, a redacted copy of the letter received from Telcordia. Qwest believes it is appropriate to reduce the $14,000,000.00 total cost associated with the Telcordia line sharing solution by the 15 percent identified by Telcordia. *Id.* at 3. Thus, Qwest's claim for 11,900,000.00 is proper.

Third, the long-term line sharing solution was never intended to change the line sharing product but rather was designed to automate the processes. Qwest put the interim line sharing solution in place very quickly, in order to make it possible for CLECs to order line sharing. The interim solution required manual intervention and was always intended as a temporary process. All line sharing orders submitted through the interim process were forced to "fall out" of the system for manual handling. Those line sharing orders did not flow through Qwest's OSS. The long-term solution was necessary to improve flow through for line sharing orders. No functions were added because the long-term solution was designed to provide the same line sharing services as the interim solution only in a more fully automated and efficient manner. *Id.* at 3-6.

Finally, Qwest shared the OSS modification costs with other ILECs as much as Telcordia permitted. A negotiation process with Telcordia led to the final, agreed upon price. Each ILEC is a separate customer of Telcordia, and Telcordia deals with each ILEC individually. Because each ILEC has a separate relationship with Telcordia, a joint modification project would have been very time-consuming and would have delayed Qwest's ability to offer line sharing. In the end, Telcordia developed a common solution, and Qwest negotiated the best deal it could obtain with Telcordia to implement that solution. *Id.* at 6.

XI. Operator Services and Directory Assistance

In its *UNE Remand Order*, the FCC held that incumbent LECs are not required to unbundle Directory Assistance and Operator Services ("OS/DA") except for limited circumstances where incumbent LECs do not provide customized routing to allow requesting providers to route traffic to alternative providers. The FCC stated:

> We find that where incumbent LECs provide customized routing, lack of access to the incumbents' OS/DA service on an unbundled basis does not materially diminish a requesting carrier's ability to offer telecommunications service. The record provides significant evidence of a wholesale market in the provisioning of OS/DA services and opportunities for self-provisioning OS/DA services. . . . Accordingly, incumbent LECs need not provide access to its OS/DA as an unbundled network element."[52]

The FCC's decision makes sense given the functionality of customized routing. As Barbara Brohl testified, "Customized Routing permits CLEC to designate a particular outgoing trunk that will carry certain classes of traffic originating from CLEC's endusers. Customized routing enables CLEC to direct particular classes of calls to particular outgoing trunks which will permit CLEC to self-provide or select among other providers of interoffice facilities, operator services and directory assistance." Ex. Qwest-12 (Brohl Reb.) at 3.

As a consequence of the FCC's decision to relieve incumbent LECs from unbundling OS/DA, the FCC eliminated TELRIC pricing for OS/DA when customized routing is available.

---

[52] *UNE Remand Order* ¶¶ 441-42.

The FCC recognized the inapplicability of TELRIC pricing for OS/DA in its opinion and order pertaining to SBC's 271 application in Texas. The FCC stated:

> Checklist item obligations that do not fall within a BOC's obligations to provide unbundled network elements are not subject to the requirements of sections 251 and 252, including the requirement that rates be based on forward-looking economic costs. Checklist item obligations that do not fall within a BOC's UNE obligations, however, still must be provided in accordance with sections 201(b) and 202(a), which require that rates and conditions be just and reasonable, and not unreasonably discriminatory.[53]

Given these statements, an incumbent LEC that offers customized routing does not need to provide OS/DA services on an unbundled basis and may charge market-based rates for its services.

Against this legal authority, Qwest recommends that the Commission adopt Qwest's proposed market-based rates for OS/DA because Qwest offers customized routing and has developed a process whereby CLECs may request and receive the service. Ex. Qwest-12 (Brohl Reb.) at 3-4. There are five distinct charges for directory assistance where these market based rates would apply: local directory assistance charges, national directory assistance charges, call branding, set up and recording charges, non-recurring loading charges, loading branding charges, and call completion link charges. Ex. Qwest-13 (Brotherson Dir.) at 47. Additionally, Qwest's Toll and Assistance operator Services are offered under two pricing options. *Id.* at 48. Option A offers a per message rate structure for operator handled calling card, machine handled calling card, station call, person call, connect to directory assistance, busy line verification, busy line interrupt, and operator assistance. *Id.* at 48. Option B. offers a work second and a per call structure for operator handled calls, machine handled calls, and nonrecurring charges for call branding, set-up and recording, and loading brand per switch. *Id.*

---

[53] *SBC Texas 271 Order* ¶ 348.

The Joint Intervenors only objection to Qwest's recommendation is that Qwest offers customized routing through an ICB pricing structure. *See* Tr. at 562 (Malone). The Joint Intervenors claim that because customized routing is handled ICB, Qwest does not provide the necessary custom routing for a UNE-P entrant to direct their OS/DA services to an alternate provider. *See* Tr. at 562 (Malone). However, the fact that Qwest offers customized routing through an ICB pricing structure does not indicate that Qwest is not offering customized routing. Tr. at 562 (Malone). As established in the written testimony and during the hearing, Qwest allows CLECs to receive customized routing if they desire. Ex. Qwest-12 (Brohl Reb.) at 3-4; Tr. at 562 (Malone). Also, the CLECs have never requested customized routing from Qwest. Accordingly, the Joint Intervenors' claims are without merit, and the Commission should accept Qwest's recommendation.

XII. Reciprocal Compensation

Section 252(d)(2)(A) of the Act and the FCC's rules implementing that section govern the appropriate rates for reciprocal compensation. Section 252(d)(2) provides that reciprocal compensation for transport and termination of traffic must "provide for the mutual and reciprocal recovery by each carrier of costs associated with the transport and termination on each carrier's network facilities of calls that originate on the network facilities of the other carrier" and must be determined "on the basis of a reasonable approximation of the additional costs of such calls."

In its recent order addressing reciprocal compensation for Internet traffic, the FCC ruled that Internet traffic is interstate in nature and that, accordingly, the FCC has exclusive jurisdiction to decide the appropriate form of intercarrier compensation for this traffic.[54] In ruling that this traffic is interstate and is not subject to the reciprocal compensation provisions of

---

[54] Order on Remand and Report and Order, *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, Intercarrier Compensation for ISP-Bound Traffic*, CC Docket Nos. 96-98 & 99-68, (rel. Apr. 27, 2001)("*ISP Order on Remand*").

section 251(b)(5) of the Act, the FCC stated that "state commissions will no longer have authority to address this issue."[55]

As a result of this order, the Commission no longer has authority to rule on the appropriate form of intercarrier compensation for Internet traffic. Accordingly, the parties have agreed to remove this issue from this proceeding.

XIII. Conclusion

For the reasons stated, Qwest requests that the Commission adopt the costs and rates that Qwest has proposed.

DATED: August 31, 2001

Respectfully submitted,

Qwest Corporation

By:____________________

Timothy Berg
Theresa Dwyer
FENNEMORE CRAIG
3003 North Central, Suite 2600
Phoenix, Arizona 85012

John Devaney
Norton Cutler
PERKINS COIE LLP
607 Fourteenth Street, N.W.
Suite 800
Washington, D.C. 20005-2011

Attorneys for Qwest Corporation

---

[55] *ISP Order on Remand* at ¶ 82.

ORIGINAL and 10 copies of the
foregoing hand-delivered for filing
this 31st day of August, 2001 to:

Docket Control
ARIZONA CORPORATION COMMISSION
1200 West Washington
Phoenix, Arizona 85007

COPY of the foregoing hand-delivered
this 31st day of August 2001, to:

Maureen Scott
ARIZONA CORPORATION COMMISSION
Legal Division
1200 West Washington
Phoenix, Arizona 85007

Steve Olea, Acting Director
Director, Utilities Division
ARIZONA CORPORATION COMMISSION
1200 West Washington
Phoenix, Arizona 85007

Lyn Farmer, Chief Administrative Law Judge
Hearing Division
ARIZONA CORPORATION COMMISSION
1200 West Washington
Phoenix, Arizona 85007

Dwight D. Nodes, Chief Administrative Law Judge
Hearing Division
ARIZONA CORPORATION COMMISSION
1200 West Washington
Phoenix, Arizona 85007

COPY of the foregoing e-mailed/mailed
this 31st day of August 2001, to:

Richard S. Wolters AT&T 1875 Lawrence Street, Room 1575 Denver, CO 80202-1847	Attorney for AT&T rwolters@att.com fax: 303-294-7338
Allen Wong AT&T 1875 Lawrence Street, Room 1575 Denver, CO 80202-1847	Attorney for AT&T allenwong@ems.att.com

Rex M. Knowles XO Communications, Inc. 111 E. Broadway, Suite 1000 Salt Lake City, UT 84111	Attorney for XO Communications rknowles@nextlink.net fax: 801-983-1667
Joan Burke OSBORN MALEDON, P.A. 2929 N. Central Avenue, 21st Floor Phoenix, AZ 85067-6397	Local Counsel for AT&T and XO Communications jsburke@omlaw.com fax: 602-640-6074
Mary S. Steele Greg Kopta DAVIS WRIGHT TREMAINE LLP 2600 Century Square 1501 Fourth Avenue Seattle, WA 98101-1688	Attorneys for AT&T Communications of the Mountain States, Inc. and XO Communications marysteele@dwt.com gregkopta@dwt.com fax: 206-628-7699
Richard Sampson Z-TEL COMMUNICATIONS, INC. 601 South Harbour Island Suite 220 Tampa, Florida 33602	Attorney for Z-Tel Communications rnsampson@z-tel.com fax: 813-273-6861
Steve Sager, Esq. McLeodUSA TELECOMMUNICATIONS SERVICE, INC. 215 South State Street, 10th Floor Salt Lake City, Utah 84111	Attorney for McLeodUSA Telecommunications Service Inc. ssager@mcleodusa.com fax: 801-993-5870
Ray Heyman ROSHKA HEYMAN & DeWULF 400 North 5th Street, Suite 1000 Phoenix, AZ 85004	Attorney for Alltel Communications rheyman@rhd-law.com fax: 602-256-6800
Michael W. Patten ROSHKA HEYMAN & DeWULF 400 North 5th Street, Suite 1000 Phoenix, AZ 85004	Attorney for Cox Arizona Telecom, Inc., e-spire™ Communications, McLeodUSA Telecommunications Services, Inc., Teligent, Z-Tel, MGC Communications mpatten@rhd-law.com fax: 602-256-6800
Dennis Ahlers Senior Attorney ECHELON TELECOM, INC.	Attorney for Echelon Telecom, Inc. ddahlers@aticomm.com fax: 612-376-4411

730 Second Avenue South, Suite 1200 Minneapolis, MN 55402	
Thomas H. Campbell LEWIS & ROCA 40 N. Central Avenue Phoenix, AZ 85007	Attorneys for Rhythms Links, Inc., Time Warner, WorldCom, Echelon Telecom, Allegiance tcampbell@lrlaw.com fax: 602-734-3841
Brian S. Thomas TIME WARNER TELECOM 520 SW Sixth Avenue, Suite 300 Portland, OR 97229	Time Warner Telecom brian.thomas@twtelecom.com fax: 503-416-1876
Thomas F. Dixon WorldCom, Inc. 707 17th Street Denver, CO 80202	Attorney for WorldCom thomas.f.dixon@wcom.com fax: 303-390-6333
John Connors WorldCom, Inc. Law and Public Policy 707 17th Street, Suite 3600 Denver, CO 80202	Attorney for WorldCom John.connors1@wcom.com fax: 303-390-6333
Eric Heath SPRINT COMMUNICATIONS CO. 100 Spear Street, Suite 930 San Francisco, CA	Attorney for Sprint Communications eric.s.heath@mail.sprint.com fax: 415-371-7186
Steven J. Duffy RIDGE & ISAACSON, P.C. 3101 North Central Avenue, Ste. 1090 Phoenix, Arizona 85012-2638	Attorney for Sprint Communications sduffy@sprintmail.com fax: 602-230-8487
Megan Doberneck, Senior Counsel Nancy Mirabella, Paralegal COVAD COMMUNICATIONS COMPANY 4250 Burton Drive Santa Clara, CA 95054	Attorney for Covad Communications mdoberne@covad.com nmirabel@covad.com fax: 408-987-1111
Michael Grant Todd C. Wiley GALLAGHER & KENNEDY 2575 E. Camelback Rd. Phoenix, AZ 85016-9225	Attorneys for Electric Lightwave, Inc., COVAD Communications, Inc., New Edge Networks mmg@gknet.com fax: 602-530-8500

Michael B. Hazzard KELLEY DRYE AND WARREN 1200 19th Street, NW Washington, DC 20036	Attorney for Z-Tel Communications mhazzard@kelleydrye.com fax: 202-955-9792

Diane Poole-McBride

PHX/1220379.1/67817.240